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BETTER FRUIT

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NUMBER 11

food

- 1 - buy it with thought
- 2 - cook it with care
- 3 - use less wheat & meat
- 4 - buy local foods
- 5 - serve just enough
- 6 - use what is left

don't waste it

U. S. FOOD ADMINISTRATION

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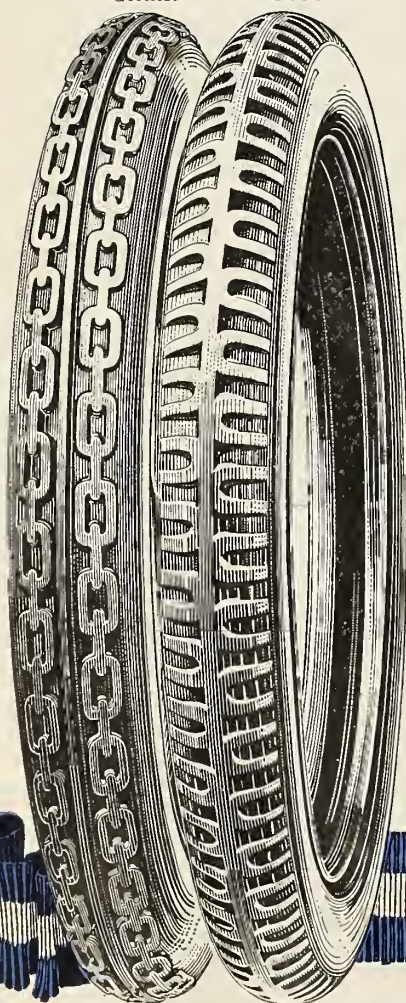
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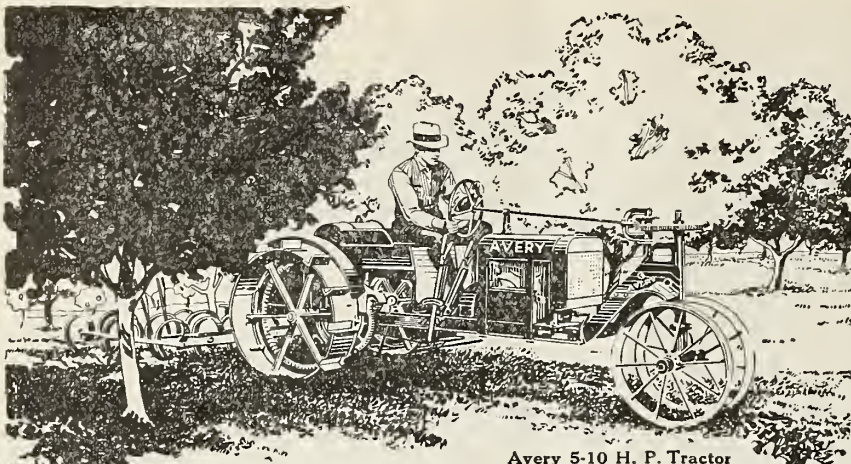
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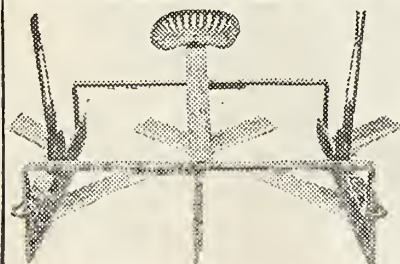
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Essentials of Air-Cooled Storage Houses

W. C. Quick, Yakima, Washington

THE term "air-cooled storage" is used to designate that method of storage which utilizes the natural atmospheric temperature for cooling. It differs essentially from cold storage in that no mechanical means of refrigeration is supplied to cool the fruit or to maintain it at storage temperature. It does not and cannot take the place of cold storage, but it does supply a satisfactory method for the keeping of certain varieties of apples which go onto the winter market.

Having in mind the recent car shortage which the country has experienced, I think it is not necessary for me to point out the pressing need for storage facilities in the apple producing regions. I do want to call your attention in passing, however, to the use that can be made of the air-cooled storage in solving our labor difficulties at harvest time. The shortage of labor has been serious during the past two years and promises to become more serious with the continuance of the war. Air-cooled storage will help to solve the problem in this way:

Fruit can be stored loose in boxes, thereby deferring the labor of packing from the rush of harvest time when laborers are scarce to the dull months of winter when laborers are comparatively plentiful. Where the storage house is situated on the ranch, the labor of packing is often performed by the rancher and his family or hired man at a time when they would otherwise be unemployed. The plan, therefore, has the double advantage of releasing packers for other work during the busy harvest season and of furnishing employment for the rancher and fruit laborers during the dull season.

The Department of Agriculture began an investigation of air-cooled storage houses in the Northwest in 1915. Believing that apples keep best at a temperature of 32 degrees, we hoped to learn what type of storage house could be cooled most rapidly in the fall, what provisions are necessary for the maintenance of storage temperatures, and what provisions are necessary to prevent shriveling of the apples in consequence of dry atmospheric conditions. In order to learn about the necessity for ventilation, we placed recording thermometers in a number of storage houses. These instruments were placed in a representative part of the storage room, neither in the coldest nor in the warmest part. The instruments were left from the time the fruit was put into storage until it was taken out in the spring, and they kept for us a continuous record of the air temperature within the house. Some of the thermo-

graphs had humidity recorders attached to them. We have used electrical thermometers for recording fruit temperatures within large blocks of fruit. They were necessary to determine whether there was a uniformity of temperature throughout the storage room.

But we wanted to compare the fruit stored in one house with the fruit stored in some other houses which were built after a different plan. This we did by placing comparable lots of fruit in different houses and making withdrawals from storage at three times during the winter for the purpose of comparison.

With profound sorrow we announce
the death of

Edward H. Shepard

on Monday, the twenty-ninth of April
Nineteen hundred and eighteen

Better Fruit Publishing Company
Portland, Oregon

From the investigations we have concluded that the three features of paramount importance in the construction of air-cooled storage houses are ample provision for ventilation, for insulation, and for humidity control. In order to emphasize the necessity for such provisions let me call your attention to the condition which existed in some poorly constructed basements on December 10 of the past year. At that time we inspected the fruit and took temperature records in a number of storage houses. In poorly constructed basements we found the temperature ranging from 47° to 52° in the greater part of the fruit. Needless to say, the apples were riper, softer, greasier and in some cases more shriveled than they should have been. It is evident that such condition was avoidable, because on the same date, in the same valley, the apples in well ventilated houses were firm and bright.

The one feature that we have found most important, and at the same time least understood, is ventilation. In the Yakima Valley in 1915 I think there was one house with adequate ventilators. The greatest misconception was held in regard to the capacity required in the ventilation system, probably because the builders had not considered the amount of air necessary to cool a house full of fruit. At best the fruit in air-cooled storage cools very slowly. The statement has been made that apples in this type of storage ripen more during the first three or four weeks than they do in all the rest of the

storage period, lasting ordinarily until March 1. Probably such is the case; at least it is true of poorly ventilated storage houses. The New Hampshire Experiment Station reports indicate that the ripening processes of apples go on about three times as fast at temperatures of 45° to 50° as they do at 32°. In general, the quicker the cooling and the lower the temperature at which the fruit is held, provided it is not below freezing, the more effectively are these life processes retarded, and the longer the fruit can be held at maximum dessert quality.

Another object of quick cooling is to prevent the germination of fungus spores and to retard the growth of fungus organisms which cause the decay of fruit. Quick cooling also retards the development of scalds and spots which occur in storage and which greatly depreciate the value of the fruit. We must, therefore, conclude that rapid cooling is desirable. To cool a large mass of fruit requires the circulation of immense volumes of air. The amount of course varies with the temperature of the incoming air and with the temperature and amount of fruit. The air must pass through the building in such a way as to come in contact with all the fruit. In order to secure a free and abundant flow, a free and unobstructed passage must be provided. A free and uniform distribution of air throughout the storage room demands that the house be supplied with numerous large windows in all four walls for the admission of air, a false (slat) floor under which the air can spread, and one or more outlet flues leading up from the ceiling and out through the roof. Large doors in the walls of an above-ground storage are beneficial on windy nights. The same principles are applied in the ventilation of a storage house by the gravity method as are employed in securing a draft through a furnace. Warm apples take the place of the fire, windows take the place of dampers, and a flue takes the place of the smoke stack. The cold air outside the building is heavier than the warm air inside, and pressing in through the intake windows it crowds the warm air out through the flues. The difference in the weight of the incoming and outgoing air is not great and the circulation is slow. It is therefore necessary that the windows be large and direct. The necessity for capacious ventilators cannot be over-emphasized.

In the fall of the year, when it is desirable to cool the fruit rapidly and the atmospheric temperatures are not below 29°, often much higher, an ideal

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By-Products Investigations—Need of Evaporators

By Professor C. C. Vincent, University of Idaho, Moscow, Idaho

ACCORDING to reliable data, compiled by the State Horticultural Inspection Department, the fruit acreage in Idaho is approximately as follows: Apples, 110,000 acres; prunes, 12,000 acres; peaches, 5,000 acres; mixed fruits, 10,000 acres. In 1915 there were shipped out of the state 1,125 cars of apples, 1,115 cars of fresh prunes, 175 cars of peaches and 20 cars of pears.

With this large acreage coming into bearing, it shows the necessity of evaporating plants, or a large central plant in each locality to take care of the fruits and vegetables that cannot be marketed or utilized as they ripen. That the people of Idaho have not been utilizing their food supply is shown in Mr. Sampson's report to the Byproducts Congress, when he stated that Idaho in 1913 shipped out 175 tons of dried apples, 50 tons of prunes and 75 tons of other dried fruits, while the same year the imports amounted to 185 tons of dried apples, 75 tons of dried prunes, 150 tons of dried peaches and 100 tons of other dried fruits. Similar conditions have also existed throughout the other states in the Pacific Northwest, as shown in his report.

Since the entrance of the United States into the world war the probability of a food shortage the world over, labor shortage, and car shortage, many farmers of the state have seen the necessity of utilizing as many of their products through the evaporator as possible. During this past year there have been erected four large evaporating plants, two at Meridian, Idaho; one at Weiser, Idaho, and one at Payette, Idaho. Mr. Guy Graham, state horticultural fruit inspector, estimates that there will be approximately 350 carloads of apples evaporated in these plants this fall. There are at the present time the following byproducts plants operating in Idaho:

Byproducts Plants.

Inland Empire Canning Co., vinegar, canned products, Coeur d'Alene.
 Frecons & Son, eider, Kellogg.
 Leo Bros. Vinegar Co., vinegar, Moscow.
 Juliaetta Cannery, canned products, Juliaetta.
 Oregon Packing Co., canned products, Lewiston.
 Idaho Vinegar & Pickle Co., vinegar and pickles, Payette.
 Denney & Co., dried apples, Payette.
 Idaho Products Co., dried apples and prunes, Payette.
 Weiser Food Products Co., dried apples, Weiser.
 Idaho Canning Co., canned products, Payette.
 Winn Bros., dried apples, Fruitland.
 New Plymouth Evaporator, prunes, New Plymouth.
 South Idaho Fruit Co., dried apples and prunes, Meridian.
 Idaho Products Co., dried apples and prunes, Meridian.
 Middleton Fruit Products Co., cider, Middleton.
 John Steele, dried prunes and apples, Parma.
 Overland Beverage Co., sweet cider, Nampa.
 Twin Falls Vinegar & Cider Co., vinegar, Twin Falls.

A glance at the map of Idaho will show that these plants are not sufficient to prevent the enormous waste that is bound to occur as our fruit trees come into bearing and our farms become more productive.

It is therefore up to every large fruit grower, co-operative orchard company or small farmer in every community to prevent the waste that annually occurs through windfall, cull and unmarketable fruits and vegetables. This can be done by the construction of small evaporators or canning plants. By so doing we all become important factors in this, our national crisis.

That these small plants will add materially to the net profits of the farm, and that they are a success in the East, is pointed out by Mr. Seeley of New York. He says that the small unit size dried makes the finest stock, and that there are hundreds of them in Wayne County, New York, while in the vicinity of Sodas one can see a dozen in about any direction he may look, and in these plants the best grades of evaporated stock are made.

Believing that there was a future for the small evaporator in the State of Idaho, as well as opportunities for sun drying, and realizing that possibly through this medium commercial lines of work would be further developed, the horticultural department of the University of Idaho has been gathering data on the following problems:

(1) The sun drying of fruits and vegetables.

(2) Relative merits of different types of evaporators, such as cook stove, hot air and steam.

(3) Time required to evaporate different products, temperature required, number of pounds of fresh fruits and vegetables to make one pound of dry, and moisture content of dried products.

Sun-Drying.

In view of the fact that California growers have been so successful with sun-dried fruits, it was thought that in portions of Idaho fruits and vegetables could also be sun-dried successfully. A few remarks, therefore, concerning the methods followed in sun-drying fruits in California may be of value. While a large number of growers dry their own fruit, the majority sell their products to second parties whose exclusive business is drying. The main reason why fruit can be so successfully sun-dried in California is due to the fact that in many districts of the state there is no dew and very seldom any rain during the summer, so that it is safe to leave the fruit out continuously until dried. In case of rain, the trays are piled one upon the other.

Most of the large drying grounds, consisting of several acres in extent, are worked on a co-operative basis, which insures the best available prices to the members for their fresh fruits. It is no uncommon sight to see twenty to twenty-five acres covered with one kind of fruit spread on trays. Probably the largest drying ground in the world is located in the Santa Clara Valley. The arrangement of the drying grounds in practically all districts of California are similar. The equipment necessary to operate a plant of this kind consists of

the main building, where all business is transacted, such as receiving and weighing the fruit, preparing for drying, etc. Conveniently located to this building and facing the dry grounds are the sulphur houses. These houses, which are air-tight, are made of wood, tongue and grooved, and the joints are filled with white zinc. Houses of this kind are necessary, because most of the fruits are treated to the fumes of burning sulphur before exposing to the sun.

Tracks consisting of light rails run into the sulphur houses, so that the trucks containing the trays of fruit can be pushed in and out. To facilitate the handling and reduce the cost to a minimum, tracks run the full length of the drying grounds. Wooden trays three feet by six feet are used. When the business is conducted on a commercial scale, much of the equipment as described above is needed. On the other hand, if a grower wishes to go into the business on a small scale, very little equipment, aside from trays, is needed.

In Idaho there are a great many fruits and vegetables that can be utilized by sun-drying. It is very evident, as demonstrated by the experiments conducted at the University of Idaho, that such fruits and vegetables as apricots, cherries, peaches, raspberries, loganberries, dewberries, peas, beets, turnips, beans, carrots and corn can be dried successfully. In the table following are shown a number of different kinds of fruits and vegetables that have been sun-dried, and the length of time required to dry.

Products	Weight Fresh	Weight Dry	Time to Dry
Peas	100	25	37 hours
Beets	100	11	4 hours
Turnips	100	8	7 hours
Beans	100	12	19 hours
Carrots	100	15	11 hours
Corn	100	28	30 days
Currants	100	28	4 hours
Raspberries	100	20	7 days
Pie cherries.....	100	20	8 days
Sweet cherries....	100	25	9 days
Apricots	100	20	46 hours

The length of time it takes to sun-dry fruits and vegetables depends largely upon climatic conditions, size of the pieces and the locality. If the weather is unsettled it will take much longer to dry the products. The fruits and vegetables indicated in the foregoing table were dried under the most favorable conditions.

Cook Stove Evaporator.

For the family that wishes to dry only enough fruits and vegetables for their winter's supply the small cook stove evaporator is recommended. Sun-drying in the humid sections of the state, where there is more or less rain during the summer, should not be attempted. As it is our duty at the present time to conserve the present food supply, every family in the Northwest should own one of these small cook-stove evaporators. The products dried in the sun, on the stove or in the larger evaporators require no sugar, no special containers, and will keep indefinitely.

Continued on page 19

The Strawberry Root Weevil (*Otiorhynchus Ovatus*)

By A. L. Melander, Entomologist, Washington Agricultural Experiment Station. Read at Thirteenth Annual Meeting
Washington State Horticultural Association, North Yakima, Washington

IT was in May, 1904, that the experiment station first received intimation that the dreaded strawberry root weevil, *Otiorhynchus ovatus*, had reached Washington. A bundle of dead plants was sent in from the extensive berry fields on the shores of Lake Washington near Seattle, and in the midst of the package were two or three weevils. A couple of years later Fruit Inspector Pendleton of Seattle informed us that the insect had destroyed several hundred acres of berry plants from this infestation. Since that time we have received specimens from several places near Spokane, from Walla Walla to the Milton-Freewater district, from Kennewick, North Yakima, Everett, Anacortes, Puyallup and Olympia. There are also two closely related sister species, *O. sulcatus* and *O. rugifrons*, which occur in Washington, sometimes living with the small root weevil and sometimes working in new territory. We have seen these larger weevils from Pullman, White Salmon, Everett, Anacortes, Port Townsend, Puyallup, Kelso and Washougal. The strawberry root weevils have thus already invaded the principal berry regions of the state.

The small root weevil of the strawberry is a European emigrant which first reached the Atlantic shore about fifty years ago. The writer collected it in Illinois and Indiana twenty years ago, which was at that time about its most western distribution. In the meantime the insect has spread by jumps, probably through the sending of infected nursery stock, until now it occurs in the northern states all the way across the continent. The experiment stations of Maine, Connecticut, Michigan, Minnesota, Montana, Oregon and British Columbia have experimented with the insect and published accounts of its behavior, but none has had any very practical suggestions to offer toward a solution of its control. Weevils of all sorts are notoriously resistant and hardy insects. They do not readily succumb to poisons or contact sprays, and the fact that this weevil lives underground for practically the whole year makes the problem especially difficult.

The Kennewick-Richland district has 400 acres in strawberries whose crop is worth \$100,000 a year. The advent of the insidious root weevil was a just cause for alarm, for although the insect has only just obtained a foothold in a few fields, its past reputation was known and its present work already resulted in the utter ruin of the infested spots. One field that had produced 265 crates to the acre was being plowed up; another that had sold 300 crates had its output drop to 20 crates to the acre; still other fields were entirely gone and were lying idle. Such is the work of the weevil that a field which this year showed only the slightest signs of infestation might have the plants dead and worse than worthless the next year. Through the generosity of the Commis-

sioners of Benton County \$500 was made available this spring to the experiment station for an investigation of the pest. In undertaking the study, of course, we held out no hope of discovering a solution.

Our first experience was with a farmer whose berry field had been destroyed by the weevil. "No, you can't experiment here," said he. "There is too much bedevilment of the farmers by you state-paid men. Leave us alone and we will work out our own problems." When asked what solution he had found for the weevil he explained that he was going to plow out his field and grow alfalfa. Now, plowing out a ruined field is the best possible means of sending the weevils out over the country. The insects cannot be killed by the plowing and when there are no longer berry plants they will move on to new fields where they can find their desired food. It would be comparable to a system of fighting smallpox by turning all the patients out of the pest-house and letting them go where they will. It is a safe bet to say that this respected citizen of Kennewick, with all his notions for state economy, scattered weevils enough to cost his neighbors future losses that will be measured by many, many thousands of dollars.

To make a long story short, we may outline enough of the life history of the root weevil to make intelligible why we undertook certain experiments. At Kennewick the insect hibernates in the white grub or larval condition, among the roots of the plants on which it had been feeding, from two to four inches down in the soil. A very few of the grubs live in the crowns of the plants, which then become riddled by their hurrowing. In the spring, preceding the blossoming period, the larvæ change to the soft pupa state in cells or chambers in the soil. With the maturing of the crop of berries the adult weevils transform from the pupæ. By the time the crop is picked the weevils are depositing eggs for the next generation of larvæ. The work of these summer and fall larvæ kills the roots, so that in the spring infested plants appear sick or dead and can be readily dislodged and pulled up, but the weevils remain behind. The adults have the habit of playing 'possum and feign death for many minutes when disturbed, drawing in their legs and feelers so as to be quite difficult to discern among the plants and in the soil. Root weevils are wingless and so spread only slowly through a field. The customary system of mowing and harrowing the plants in midsummer undoubtedly serves to scatter the weevils broadcast, as it is done at the height of the normal migration season. As the insects are known to be able to subsist on many dozens of common plants they cannot be starved out of a field by plowing out the plants. We have found them living in the ground in a clean cultivated apple

orchard several blocks removed from the nearest berry field. As the insects at the time of the experimentation last May were all beneath the soil the problem of their control was limited to subterranean treatments. It will be of interest to not what was tried, even though without success, for the hardness of the weevil can then be better appreciated.

First—Crushing the insects in the ground. Since the weevils in all their stages are scarcely ever more than four inches down it has been thought that disking, hoeing, harrowing, plowing, rolling or tamping the soil should kill them. Accordingly, to make a test we secured a ten-pound sledge hammer and dropped it ten inches, twenty inches and thirty inches; in each case having little effect on the insects beneath the ground. So the writer buried his hand under three inches of Kennewick soil and permitted the sledge to be dropped as before. He was surprised to find that the cushioning effect of the soil made the impact of the weight scarcely felt. A quantity of weevils was then put in the ground and the sledge swung overhead with all possible force time and again on them. The ground was pulverized, the berry plants were torn to shreds, but actually half of the weevils were unharmed and were still alive in the cages far weeks afterwards. It was concluded that mashing the strawberry root weevil in the soil was impracticable.

Second—Drowning the weevils. It is often possible to flood a strawberry field, so to make a test of its value against the root weevil, some of the beetles were held under water for several hours. When they were permitted to dry they revived unharmed from the bath. As a matter of fact, we have found weevils abundant in the wet soil about the intakes for irrigation water, where they are periodically submerged for days at a time. It was concluded that the strawberry root weevil could not be killed in a practical way by drowning.

Third—Killing in the soil by contact insecticides. It ought to be perfectly possible to pour over the worst infested spots some materials which would soak in and kill the weevils; but it isn't. We soaked the ground with strong soap-suds, oil emulsions and solutions of borax and of copperas, but with no apparent discomfort to the weevils or their larvæ, although in most cases the plants were completely killed. Such treatment was accordingly judged impracticable.

Fourth—Killing by poisonous fumes and gases. We placed in holes different measured quantities of standard insect killers, such as carbolineum, cenol, kresol, carco and crude petroleum oil; we used gasoline, kerosene, turpentine, chloroform and carbon disulphid; we generated the poison gases chlorine, sulphur dioxide, acetylene and cyano-

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gen: but in no case did the effects extend for more than a few inches from where the materials were used. The problem certainly looked hopeless. It involved a mixture of the chemistry of poisons, the soil physics of penetration, diffusion and absorption of fumigants, the botany of what will harm strawberry plants and what is safe to use, the entomology of a weevil that won't stay killed, and the practical considerations of cost, labor and applicability.

Of the soil fumigants the cyanide gas and the carbon disulphid had alone surely killed enough insects to give promise. The cyanide was discarded because it destroyed the plants and because it is one of the most dangerous of poisons to man. With the carbon disulphid then the problem was to prevent its diffusing out of the soil, and this was readily accomplished by covering the plants with oilcloth. Preliminary tests were more than gratifying: the weevils, the larvæ and the pupæ were killed even with small doses if the fumes were only confined. The fumes, being heavy, permeated the soil and reached not only the weevils several

inches down, but the wireworms, tipulids and all other insects as well.

The *modus operandi* of the treatment is absurdly simple. First search out the spots in the rows where the weevil has practically killed the plants. Next observe by closely looking about the base of the adjacent plants whether the weevil is present and how far it extends beyond the sickly plants. Then cover the infested part of the row with, say, a 30-foot strip of canvas or cloth sheeting previously made gas tight by a painting with linseed oil. If care is used to prevent tearing, cheap oilcloth may be substituted for the oiled canvas. Every five feet under the cloth place a saucer containing two-thirds of an ounce of carbon disulphid, which should cost less than one cent, and leave in place for at least six hours. This completes the treatment; but care must be taken to keep the edges of the canvas tight against the ground, which can easily be done by shoveling some earth along the edges of the cloth to weight it snugly down. The cloth should not touch the saucer, since the liquid should evaporate quickly. If the plants do not support the cloth suffi-

ciently a strip of wood propped up to just clear the plants can serve to support the covering and permit diffusion of the fumes. Carbon disulphid is an explosively inflammable liquid requiring as careful handling as gasoline and its fumes should not be unduly inhaled. While the treated plants may wilt, especially through the sweating under the cloth during the heat of the day, the injury is not permanent.

While the method of using this treatment is simple and its cost is not at all prohibitive as compared with the value of the crop at stake, it must not be misunderstood that we have worked out a process that automatically controls the pest. It requires patient, careful labor to insure eradication, and as the time for best utilizing the treatment is probably limited to the few days immediately after the crop is gathered, before migration and egg-laying begin, enough equipment is needed to provide for the infested field. The treatment is mainly intended to kill the weevil where it has already destroyed the plants and to check its further spread through the fields. If the weevils are not checked the damage to be done by the next generation can well be fifty-fold greater. Its use can be extended to the acreages where there is a light scattering of the weevil here and there, and where fields are as valuable as those at Kennewick it would assuredly be advisable to endeavor to reclaim them. It is either the cost of a treatment or quitting the berry business.

There are still questions enough about the weevil that are unanswered: How will the covered fumes act in other kinds of soils? Has the weevil laid eggs by the time the crop is off, and if so, what effect will carbon disulphid have upon them? Is not late fall or early spring a better time to make the application? Is the life history of the insect in other localities in Washington sufficiently like at Kennewick to depend on timing the treatment elsewhere by the maturing of the berries? To these questions we haven't the answer, for in this little study we had but three weeks' opportunity to "bedevil the farmer."

Bulletin on Spraying Stone Fruits

Brown rot of stone fruits, California Peach Blight, causing fruit spot of peaches, and many other destructive pests and diseases may all be greatly reduced by proper methods which are set forth in the new bulletin "Spraying Stone Fruits," just off the press at Oregon Agricultural College. Of all the fruits, none are more important in the present war emergency than the stone fruits. Dried prunes and canned peaches and cherries form an important part of the food stores of the nation and the army abroad. This bulletin gives the latest information on methods of controlling insect pests and fungous diseases affecting these important fruits and will aid growers in the patriotic duty of helping Uncle Sam to increase food production by reducing crop losses due to these troubles. It may be had free for the asking. Send for your copy today to Oregon Agricultural College, Corvallis.

Home Vegetable Garden

The first of a new series of bulletins dealing with the home vegetable garden has just been published and is ready for distribution to all who appreciate the value of the garden as a means of economy in wartime. The series is being prepared by A. G. Bouquet, of the Oregon Agricultural College vegetable garden section of the horticultural division. Factors that were wholly or partly responsible for failures with war gardens in past years receive particular consideration in the first bulletin, together with suggestions for remedying the troubles. Emphasis is also laid on the present seed shortage and the possibility of the use of some of the 1917 seed stocks, especially if a simple test be made at this time. A practical planting plan for the home garden is given, together with a suggestive list of the horticultural varieties of each vegetable. Methods of soil preparation and fertilization are described, and a list of all bulletins of benefit to vegetable gardeners, published by the U. S. Department of Agriculture, Washington, D. C., and the Oregon Agricultural College, Corvallis, is given. The new college bulletin should be in the hands of all those who are endeavoring to make their gardens count for the utmost.

Provide Seed for Replanting

Seed stocks of all kinds are reported scarce. The farmer who has a good supply of seed for coming crops is, indeed, fortunate. Farmers who have no seed are obtaining supplies earlier this year. The University of Missouri College of Agriculture suggests that, in view of the necessity for replanting in some seasons, farmers obtain or reserve sufficient seed for replanting. In many states last year, corn and wheat on low lands were destroyed by overflows. The water went down early enough that the land could be planted to early-maturing corn, but few farmers had such seed on hand. They were delayed from several days to two weeks in obtaining seed. If possible it would be a profitable precaution to reserve enough seed for such emergencies. This applies particularly to the tender tilled crops, including corn, sorghum, beans, cowpeas and soy beans.

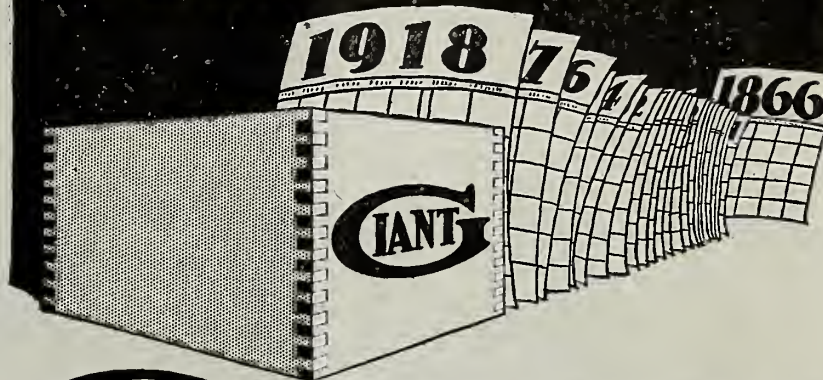
The most practical substitutes for white flour are whole wheat flour, shorts, cottonseed meal and corn meal, since they all make palatable bread and may be obtained everywhere. At present prices, the regular use of any of these means a decided saving in the cost of bread.

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vated crop, and they should be taken up largely by the general farmer, said W. I. Spencer, of Gresham, in his address before the Vegetable Growers' and Home Gardeners' Conference. In selecting the crop to be grown take into consideration its requirements as to climate, soil, and whether it is a money crop in the section grown. Cabbage is an instance of one often grown and under suitable conditions will return a good cash income and in addition furnish from one-half to one ton of cow feed to every ton of heads cut, a factor to be carefully

considered by the farmer who keeps dairy cows. Fall plowing is the best insurance for a good crop of vegetables in the Willamette Valley. Grow or secure the best seed to be had in growing onions and do not expect to secure unusual success unless you do. That, together with the fertility of the soil, are the prerequisites for successful onion production, thinks J. C. Leedy of Beavertown. If the soil is deficient in plant foods the best all around fertilizer is well-rotted manure spread on the ground the year before.

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Some Phases of Alfalfa as a Crop in the Orchard

By P. S. Darlington, Horticultural Inspector at Large, Wenatchee, Washington

UP until recent years the fruit business in this state has been on a very unstable basis. We clean cultivated our orchards, kept little or no live stock, and perhaps not even a garden. We were so enthusiastic over the fruit business that we forgot that there might come a year when there would not be a profit in the fruit business with which we could buy our provisions at the store. We have since seen some such years. We have seen years when the credit of a good many of our fruit growers at the grocery store was not gilt edge, and in fact some of them got hungry and walked out. In 1911 we shipped into Wenatchee 150,000 pounds of butter, 20 carloads of canned milk, 200 gallons of fresh milk a day, 42,000 dozen eggs, 20 carloads of packing house products and about 1800 tons of hay. Our farmers, if they could be called that, were going to town and buying their milk, butter, eggs, meat, etc. Wenatchee probably carried this condition to greater extreme than most other sections in the

state, but perhaps necessity has caused the orchardists of Wenatchee to advance farther toward correcting this condition than has been the case with the orchardists of most other districts.

Clean cultivation was not only starving our orchardists but was also starving our orchards. If there is anyone here that does not know what a starving orchard looks like, just take a drive out through any of the older orchard sections next summer and you will see here and there an orchard with small, sparse and yellowish looking foliage, red or yellowish bark and probably a light crop of small apples. These are indications of partial starvation. This condition may be brought about by any one of a number of different causes, but whatever the cause the effect is partial starvation. In some cases it may be due to lack of water, but since all plant food must be taken up in the form of solution lack of water is starvation. In a light, sandy soil it may be due to too much water, in which case the soluble elements of plant food are leached

away. It may be due to an impoverished soil, but there are comparatively few of our soils but what contain enough of the elements of plant food to properly nourish the trees if the elements of plant food that are in the soil are made available to the tree. This appearance of starvation is most frequently due to the fact that the elements of plant food which are in the soil in abundance are, on account of the lack of the proper physical condition of the soil not made available to the tree. An ideal apple soil is a rich heavy loam. But this type of soil as well as other types, if clean cultivated for a period of years becomes void of humus and organic matter. The soil particles then readily run together. In this condition the soil breaks up cloddy. It puddles easily when wet. It does not take water readily. In fact a strata just beneath the surface cultivation develops, which becomes almost impervious to water and almost as hard as hardpan. A soil in this condition, though it may be ever so rich in the elements of

plant food, will not release or make available to the tree plant food in sufficient quantities to properly nourish the tree.

This condition of the soil has been brought about by the continuous burning up and almost continuous exhaustion of the organic matter in the soil. This is the result of continued clean cultivation without addition of organic matter to the soil. The point that I want to bring out most forcibly here is that our soil troubles are mostly physical rather than chemical, and that the addition of chemical or commercial fertilizers can do little toward the permanent upbuilding of our soil conditions. Further, without an adequate supply of humus or organic matter we do not get full benefit of whatever chemical fertilizer we may use. To build up and maintain a constant supply of available plant food with the least possible waste we must have humus or organic matter in the soil. Humus is decomposed organic matter. Humus acts as a sponge to not only hold moisture but to hold available elements of plant food. In the decomposition of organic matter various weak acids are formed, known as humic acids. These weak acids have a dissolving effect upon the soil particles and change the otherwise unavailable elements of fertility into available form. Humus holds the soil particles apart and prevents the soil from becoming hard and compact.

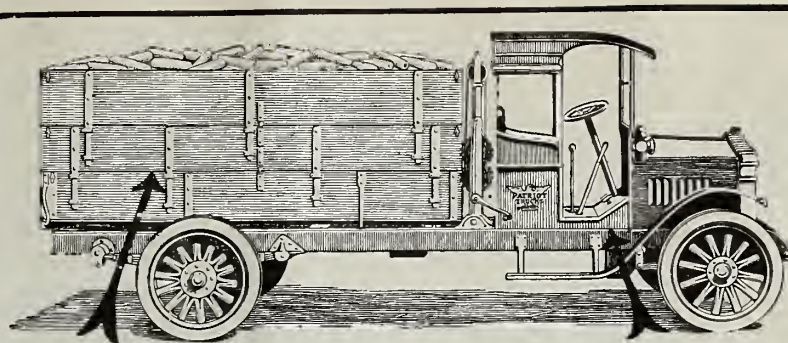
In my opinion any system of orcharding in our semi-arid irrigated districts which does not provide for a goodly supply of organic matter in the soil is not a permanent or sound system of orcharding. I shall not enter here into any extended discussion of the different methods of supplying that humus any more than to say that under conditions existing generally in our fruit sections far the cheapest and most economical method of supplying that humus, together with additional fertility, is by means of cover crops. Neither is it my purpose here to enter into a discussion of the merits and demerits of the different cover crops any more than to say that no other crop has yet been introduced that has as much to recommend it as an orchard cover and manure crop as alfalfa.

Alfalfa produces an immense mass of vegetative matter not only above but also below ground. I believe that it is unexcelled in this respect by any other crop we can grow in our orchards, and as is explained above it is vegetative or organic matter in the soil that we need. Alfalfa is a soil renovator. It is a more successful soil renovator than plow or harrow, or even dynamite. No plow sole forms in an alfalfa field nor in an orchard sowed to alfalfa. Alfalfa roots penetrate the soil to the depth of 20, 30 or 40 feet and have been known to go down to a depth of 127 feet. The decaying roots and side laterals of the alfalfa keep the soil open and porous for the penetration of air and water. Alfalfa is a legume and therefore a nitrogen gatherer. It not only gathers nitrogen from the air but it penetrates the soil far below the reach of ordi-

nary plants, brings up other elements of plant food and makes them available at the surface. It has been estimated at the New Jersey Experiment Station that the amounts of plant food gathered by a test acre of alfalfa in two years were equivalent in nitrogen to 3500 pounds of nitrate of soda in phosphoric acid to 600 pounds of bone black superphosphate, and in potash to 1200 pounds

of muriate of potash. This amount of fertilizers before the war would cost about \$124, the nitrogen alone being worth about \$105; and this was taken almost entirely from the air. The water requirement is usually the first question that interests most growers in the discussion of this subject. The water requirements depend almost en-

Continued on page 13



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EDWARD HENRY SHEPARD.

Mr. Shepard is dead. There is sorrow in his home. Friends and business associates mourn. The announcement from St. Vincent's Hospital Monday morning, April 29, of his passing came as a shock. Cheerful even in his illness, his friends had believed he was soon to be with them again, and their grief is keen.

Mr. Shepard sacrificed his life in a conscientious devotion to his work. Fruit growers in the Pacific Northwest, in whose interests he labored for more than fifteen years, owe him a debt that never could have been paid. It was said of Mr. Shepard that no one man did more to make fruit growing a business enterprise and to direct the marketing to profitable channels.

Sixteen years ago Mr. Shepard purchased an orchard in Hood River Valley. Years before that he had devoted his studies to horticulture, and with the purchase of a farm he put his theories into practice. The fruit growers of Hood River soon recognized his ability, and he was made manager of the Hood River Apple Growers' Union. One of his first acts was to improve the grade and pack of apples, and he drew up the original rules for grading and packing which were adopted throughout the Northwest. For twelve years he was a director of this association, which later became known as the Apple Growers' Association of Hood River. He was manager for six years of the Hood River Fruit Growers' Union, which shipped strawberries and small fruits. The Hood River Fruit Growers' Union later was merged into the Apple Growers' Association.

In 1903 he established BETTER FRUIT, a magazine, as its name implies, devoted to the fruit growing industry. Readers of BETTER FRUIT will testify to his great work in helping orchardists and mar-

keting associations solve their vexing problems.

Mr. Shepard was an early advocate of co-operation in the production and marketing of fruit. For the past fifteen years managers of the fruit fairs or horticultural conventions in the Pacific Northwest, and even in the far Eastern states, never considered their program complete without having Mr. Shepard appear for an address. He gave freely of his time, energy and money to make these addresses, and there are many who owe their success today to the advice given by Mr. Shepard.

Mr. Shepard was born in Marysville, California, December 24, 1857. His father, Mr. E. A. Shepard, was a skilled horticulturist in New England many years ago, and on moving to California made a reputation as an authority on matters of fruit culture. It may be said that Mr. Shepard grew up in an atmosphere of horticulture. In 1880 he graduated from the University of California. He always took an active interest in collegiate affairs and was the prime mover in organizing the University Club of Hood River several years ago. At college he was a member of the Zeta Psi fraternity.

Mr. Shepard was a prominent member of the American Pomological Society and an honorary member of the State Horticultural Societies of Oregon, Washington and Idaho. He was also a member of the International Apple Shippers' Association, having been honored with a membership that was unique in the fact he was the only member of the association that was not a shipper.

Mr. Shepard is survived by his wife, who was formerly Miss Alice Failing of Portland, and five daughters.

The funeral services were conducted Tuesday afternoon from Mr. Shepard's late residence, by Bishop Robert L. Padlock of the Episcopal diocese of Eastern Oregon, who was a warm friend of Mr. Shepard.

Death of S. L. Allen

It was with regret we learned of the death of Mr. S. L. Allen, the inventor of the Planet, Jr., tools, who passed away a few weeks ago at his home in Florida, aged seventy-seven years. Mr. Allen was a farmer back in the early seventies, when planting was done by hand and hoeing was accomplished with the primitive hand-hoe. He was not content with the laborious methods in use at that time, and this was the commencement of the manufacturing of the Planet, Jr., tools, which are famous the world over.

To Curb Insect Losses

Farm crops in the United States are subject to millions of dollars' loss annually through the ravages of insects. Arsenical insecticides are the chief protection against the biting insects which devour the foliage of farm and garden crops. A shortage of arsenic has developed in this country. President Wilson has placed the arsenic industry of the United States under the direction of the Food Administration so that the

distribution of the poison may be equalized.

Since arsenic is the active poison in paris green, the potato farmer is quite dependent upon an adequate supply of arsenic compounds for combating the destructive potato bug. It is, therefore, planned to bring about co-operation by the state potato growers' associations and the makers of the insecticides. In this way it is hoped that stocks of insecticides for local use may be maintained. Furthermore, it is important that a sufficient supply of white arsenic be available to meet needs next year for grasshopper control. Grasshoppers were numerous in many sections last year. Dry weather, especially in winter, is favorable for grasshoppers. The grasshopper eggs remain over winter in hard ground. Moisture in the soil subjects the eggs to destructive freezing, but when winters are relatively dry comparatively larger numbers of the eggs survive. Indications are that an outbreak of grasshoppers is probable. It is therefore urgent that preparations be made in advance so that heavy losses to cereal, forage, garden, and other crops may be avoided. Arsenic is also necessary for the control of cut worms, army worms, and similar pests.

In view of the necessity for still greater production next spring and summer, the University of Missouri College of Agriculture has suggested that no means which will lessen damage from insect pests be overlooked. It is folly to devote time, labor, land, and money to a crop and then permit insects to destroy it.

Boxes, Baskets, Containers, Etc.

The increasing cost of containers for fruit growers is becoming serious, and in addition there may be a serious shortage of boxes. It behooves fruit growers to order early, because the grower who postpones purchasing may not be able to get the desired amount. The shortage of boxes may be a boon to the firms manufacturing basket containers. It has been tried and found advisable in many sections to use baskets for some varieties and some grades of fruit, which are not only found to be cheaper but will serve the purpose as well, and by using baskets wherever it is possible it will do much toward lessening the possible shortage of boxes.

Vegetable Gardens.—No fruit grower should fail to plant a vegetable garden for his home use and one large enough not only to supply his family through the season, but sufficient to produce enough vegetables so enough can be canned to last throughout the entire winter. This will be a good step in the way of food conservation and at the same time be one of economy on the part of the fruit grower as well. Fruit growers in their spare time will find it wise to plant as large a sized garden as can be properly cared for, as there is no question but what there will be a ready sale, not only for vegetables fresh, but to canneries for canning purposes.

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Some Phases of Alfalfa, Etc.

Continued from page 11

tirely upon the methods of handling alfalfa in the orchard and will be discussed more fully below. I will simply say here that conservation of moisture is one of the benefits that may be derived from alfalfa in the orchard.

I have mentioned some of the reasons why alfalfa should be beneficial to the orchard. This may be just theory. But the proof of the pudding is in the eating. We have plenty of evidence to show that the alfalfa actually does not get results. I might mention the Barney & Williams orchard which has been in alfalfa for about twenty years. This is the oldest alfalfa orchard that I know of and has the largest bearing record of any orchard that I know of. I have the bearing record of this orchard for the six years from 1907 till 1912 inclusive. The average bearing per tree per year for those six years was nineteen boxes per tree per year. Mr. Williams told me since he has harvested his 1917 crop that these trees still keep up the same performance. I could mention many other instances of beneficial results. In fact the results have been so generally satisfactory that about 75 per cent of our orchards at Wenatchee are now in alfalfa.

So far I have spoken of alfalfa as a cover and manure crop and of its direct benefit to the orchard. The ideal method for handling alfalfa as a strictly cover and manure crop for the most rapid upbuilding of the soil and for the

conservation of moisture is to allow the whole crop to fall on the ground and rot. However, there is the other phase to be considered, the matter of providing our own living, as much as possible, on the orchard farms. This is a phase that cannot be overlooked at this time. It is a phase that is in line with the recommendations of the food administration and, further than that, is in line with a policy of permanent thrift. Every orchard farm should have its family cow, a hog or two, chickens and a garden.

Where there is no shortage of water there is no reason why a crop or two of alfalfa, or even three crops, cannot be taken from the orchard if it is fed on the ranch and the manure put back on the orchard. In this way the feeding value as well as the greater part of the fertilizing value can be obtained. If we have to go out and buy feed for our stock and other animals today we are in a bad way. Alfalfa hay is selling for \$30 a ton at Wenatchee, and it is the cheapest feed we can buy at that. As I have said the water requirements of alfalfa in the orchard depends largely upon the methods of handling. If your alfalfa is strictly a cover and manure crop and you allow it all to lay on the ground I am satisfied that it does not require any more water than clean cultivation, and I earnestly believe that it requires less, although I have no accurate to prove this. I am personally unfortunate enough to be interested in an orchard for which we have to raise water over 200 feet by means of pumps.

You can readily see that with us conservation of moisture is a feature. We had the past season in our part of the state the most severe long drouth that we have had in recent years, but our orchard suffered less from drouth this year than ever because we cut only a portion of the first crop of alfalfa and none after that. It seemed a shame to see that dense mat of alfalfa fall down and rot on the ground, but we could get only a limited amount of water and we did not dare cut the alfalfa and take it off. The alfalfa saved our apple crop. As I see it now, however, we could have installed an additional pump and doubled our water supply and paid for the pump and the extra power with the alfalfa we could have saved, figuring it at \$30 a ton. We are now negotiating for a pump to double our water supply next year.

We have learned something also this year about handling our water. Up until this year we have used four or five small furrows between the tree rows, but have always experienced considerable difficulty in getting our water through these small ditches. This year we made just two large ditches with a turning plow with very much better results. We have always had the best success sowing alfalfa about the middle of August on soil that has been clean cultivated all summer. At that time it is necessary to irrigate it and is sometimes necessary to irrigate it once after that. If the soil should get dry at the time the seed is germinating or soon after that you will not have much suc-

cess getting a stand. Alfalfa sown the middle of August should get about six or eight inches high before winter and is then ready to start off good and strong in the spring.

Let me give a word of caution. Do not expect beneficial results the first year after the alfalfa has been sown. In fact it requires quite a little care the first year to prevent detrimental results. Your stand is not likely to be heavy enough the first year to afford the soil sufficient protection and the ground is apt to bake. Further than this, the little seedlings are yet shallow rooted and are taking their moisture and food from the first two or three feet of soil right in competition with the feeding roots of the trees. The alfalfa will need more water and more care the first year than any year after that, and you are not likely to see any beneficial results until the second or third year. Do not think that it is necessary to plow the alfalfa under to get results on the orchard. Your results become accumulative year after year, and the longer your alfalfa remains in the orchard the better for the orchard.

In conclusion I will read the following verse, for which I claim no originality:

What makes the landscape look so fair;
What blossoms bright perfume the air;
What plant repays the farmer's toil,
And will enrich the worn-out soil?

Alfalfa.

What is the crop that always pays,
And will mature in forty days,
Resisting drouth, the frost, and heat;
Whose roots reach down one hundred feet?

Alfalfa.

What grows in loam, and clay, and sand;
What lifts the mortgage off the land;
What crop is cut three times a year,
And no foul weeds in it appear?

Alfalfa.

What makes the swine so healthy feel,
And never raise a hungry squeal;
The wholesome food that never fails
To put three curls into their tails?

Alfalfa.

What makes all other stock look nice,
And bring the highest market price;
What fills the milk pails, feeds the calf,
And makes the old cow almost laugh?

Alfalfa.

Unusual Pies Unusually Good

War long ago uncovered the sacred American pie, now the bottom crust as known to our mothers has disappeared, and the latest offering of "Yankee ingenuity" is rice pie crust. Rice has a natural affinity for the things that usually constitute pie fillings, and this new camouflage from the first camoufleur—woman—is good for the duration of the war.

Rice Pie Crust.—Line a greased pie pan with cold boiled rice, bringing the rice well over the edge of the pan and shaping it with a spoon dipped in milk. Bake the crust in a moderate oven until it is slightly brown. Use the crust like any pastry for a one-crust pie.

Sour Milk Pie.—1 cup buttermilk or thick clabbered milk, 2 tablespoons cornstarch mixed with 4 tablespoons cold water, $\frac{3}{4}$ cup maple syrup, 2 egg yolks beaten, 1 lemon, juice and grated rind, 1 tablespoon melted butter. Heat

the milk in a double boiler. When it is warm, add the cornstarch mixed with cold water. Cook the mixture until it is thick, and add the other ingredients. Cook the mixture until it is clear. Turn it into a baked crust made with rice, cover it with meringue, and bake it in a slow oven for 25 minutes.

Meringue.—Whites of 2 eggs, $\frac{1}{4}$ teaspoon vanilla, 4 tablespoons maple syrup. Beat the egg whites until they are stiff, add the syrup gradually, and then the vanilla.

Cottage Cheese Pie.—1 cup cottage cheese, $\frac{1}{2}$ cup maple syrup, $\frac{3}{4}$ cup milk, yolk of 2 eggs (beaten), 2 tablespoons melted butter, salt, $\frac{1}{2}$ teaspoon vanilla. Mix the ingredients in the order given. Bake the pie in one crust made of rice. Cool it slightly, cover it with meringue, and brown it in a slow oven.

Lemon Cheese Pie.—1 cup cottage cheese, $\frac{3}{4}$ cup honey or $\frac{3}{4}$ cup corn syrup, yolk of 1 egg (beaten), $\frac{3}{4}$ cup milk, 2 tablespoons butter, 2 tablespoons cornstarch, juice and grated rind of 1 lemon. Heat the milk, add the sweetening and the cornstarch, and cook the mixture until it is thick, stirring it constantly. Then add the egg, and cook the mixture until the egg thickens. Add the cheese, the butter, the juice and the rind of the lemon. Pour the mixture into a well-baked crust made with rice. Cover it with meringue, and brown it in a slow oven.

Report of Cold Storage Apple Holdings April 1, 1918.

Reports from 555 storages show that their rooms contain 982,131 barrels and 2,372,223 boxes of apples. The 518 storages that reported for April 1 of this year and last show a present stock of 950,880 barrels and 2,330,615 boxes, as compared with 1,043,606 barrels and 1,504,496 boxes last year, a decrease of 8.9 per cent in the barreled apples and an increase of 54.9 per cent in the boxed apples, which is the equivalent of the total increase of 182,647 barrels or 11.8 per cent. For the purposes of this comparison it is considered that three boxes are equivalent to one barrel. The 512 storages that reported for both Decem-

ber 1, 1917, and April 1, 1918, showed a decrease of 17.2 per cent in the barreled apples and 27.2 per cent in the boxed apples, or a total decrease of 20.4 per cent during the month of March, while the 503 storages reporting their holdings for both December 1, 1916, and April 1, 1917, showed a decrease of 19.4 per cent in the barreled apple holdings and 28.1 per cent in the boxed apple holdings, or a total decrease of 22.2 per cent during March, 1917. As a few storages have not responded to our inquiries this report does not include all holdings.

Conspicuous among the many improvements that have been made from time to time for the welfare of their employes is the strictly modern cafeteria that has been recently opened by the F. Mayer Boot & Shoe Company of Milwaukee, makers of the well known brand of Honorbilt Shoes.

"Our primary reason for opening this restaurant," said F. J. Mayer, vice president of the concern, "is to give our employes a chance for greater comradeship. We are convinced that it has done that much. The increased number of patrons speaks for its success. Many who have heretofore prepared their own dinner at night are glad to be relieved of the burden and make this hot lunch at noon their principal meal."

Comradeship is not the only benefit to be derived, for the dinners served to the employes for 20 cents are certainly a revelation, especially during these times of high prices. The following menu is typical of the dinners furnished: A large bowl of vegetable soup, beef loaf, potatoes, beets, bread and butter, apple pie and coffee.

Cleanliness and efficiency are the striking characteristics of the lunch room. From the immaculate polished topped oak tables, with their pretty green and white china and shining silverware set for four, to the shining pots and kettles hanging around the stove, everything is spick and span and of the latest and most approved type.

—Adv.

A Continuous Chain of Boiling Points

—gives easy starting, quick
and smooth acceleration,
power and mileage, in Red
Crown gasoline.

STANDARD OIL COMPANY
(California)



The Gasoline of Quality

The Ideal Fruit Grader

**SIMPLICITY, ECONOMY AND EFFICIENCY
ABSOLUTELY NO BRUISING**

Just passed another very successful season. We have the highest of praise for our Grader from all of those who have used them, and from the present indications we will have all sold that we are able to manufacture this season on account of labor being very hard to get that we can use, so we wish to impress on all the growers that we urge them to place their orders very soon so we will have time to make delivery.

There is no machinery—Nothing to get out of order or be fixed connected with the Ideal Fruit Grader. It is practically all wood.

The operation is simple, consisting of a belt for a conveyor, operated by electricity or gasoline engine, and short elastic belts, which move each apple in the proper bin from the belt conveyor.

The Ideal Fruit Grader divides the crop into Extra Fancy, Fancy and C-grade, all at one time. The Extra Fancy being divided into seven bins on one side, the Fancy into seven bins on the other side and the C-grade going into six bins at the end of the grader.

Built for four sorters, the grader is 26 feet long and 9 feet wide. Built for eight sorters, 32 feet long

Further detailed information, illustrated circulars and prices will be furnished upon request.

IDEAL FRUIT AND NURSERY CO.
HOOD RIVER, OREGON

Power Farming Demonstration

A POWER farming demonstration for the Pacific Northwest will be held at Pullman, Washington, this spring May 29-30-31. This demonstration is in charge of the State College of Washington co-operating with the United States Department of Agriculture, the tractor and implement dealers of the Northwest and the Pullman Chamber of Commerce.

The Demonstration Is Needed

At the present time the greatest possible food production is demanded. The available labor is scarce. Horses cannot furnish enough farm power. The extensive use of labor and horse-saving machinery is urgent. The farmers of the Northwest are progressive and anxious to farm all their acres to the best advantage, but they cannot justly be expected to purchase and use new equipment before seeing it in actual operation, so that they may decide whether or not the implements will operate successfully on their own farms. As a matter of education and information the demonstration will prove of great value to the agricultural interests of the Pacific Northwest.

What the Demonstration Will Do

It will bring together a large aggregation of tractors, plows, tillage implements, harvesting machinery, modern trucks, and modern labor-saving machinery in general. This demonstration will be more complete than

the machinery section of a state fair, and will be of much greater value to the farmers, as it will show the machines in actual field work. Here everyone can see and compare the work of a large number of tractors in one field, an opportunity that can be had only at such a demonstration. Since both level and hilly fields will be farmed it will be possible to draw better conclusions as to what type of tractor will be successful on individual farms.

The public will be shown the use of tractors in connection with belt-driven machinery such as silage cutters, threshers and similar farm equipment. The latest harvesting and grain-handling machinery will be shown and demonstrated. In short, machinery that will save man and horse-power will be on demonstration so that all who attend will see with little expenditure of time the possibilities of doing their work more efficiently with modern equipment, and also to quickly compare the different machines for doing any particular class of work.

How the Demonstration Will Be Conducted

Over 200 acres of land in one body near Pullman is available for the tractor demonstration. This ground will be plowed by the demonstrators. During the forenoon the companies are at liberty to make individual demonstrations in fields assigned to them. At

this time demonstrations of belt-operated machines and implements other than tractors will be made. In the afternoon the regular public demonstration will be held, during which all the tractors will plow on assigned plots in one large field. After plowing part of the afternoon the plowed ground will be gone over with tillage implements such as harrows. No demonstrations of other machines will be permitted while the tractors are operating in the afternoon.

Something of interest will be going on all the time, so that it will be to everyone's advantage to attend the demonstration the entire time.

General Information

The demonstration grounds are about two and one-half miles from Pullman on a paved road. Automobile and truck service will be maintained between the city and the grounds. A large number of people can be accommodated as regards rooms and meals in town. As the weather is usually excellent at this time of year many will bring tents and camp in the grove adjacent to the demonstration field. A lunch counter will be on the grounds, so that it will not be necessary to make trips to the city for meals.

Pullman is readily accessible to all the Northwestern States, being located on the O.-W. R. & N. and the Northern Pacific Railroads. Pleasant and easy automobile trips can be made to the demonstration from Washington, Oregon, Idaho, Montana and Alberta. A



THE GOVERNMENT EXPECTS YOU

To increase your honey supply. You cannot do it unless you provide yourself with the necessary

**HIVES FRAMES SECTIONS &
FOUNDATION SUPERS MISCEL. EQUIPMENT**

Ask us to quote on your wants
Ask for our complete 1918 catalog
Ask for our latest price supplement
Ask us anything you want and if possible we will cheerfully answer you

Lilly's Seattle & Portland
Western distributors of LEWIS BEEWARE

Beware Where You Buy Your Bee Ware

parking place for automobiles will be in charge of a watchman.

Everyone in the Northwest who is interested in agriculture and is following the rapid development of modern farm power machinery with its wonderful time and labor-saving possibilities should not miss the great opportunity of seeing this machinery at work side by side in one large field. For other information communicate with the Department of Agricultural Engineering, State College of Washington, Pullman, Washington.

Get That Canning Impulse

Make your hoc this summer keep your can opener busy next winter.

Get ready for canning season now. Regrets are the only things ever canned in the jars you forgot to order.

Can nothing that can be kept without canning. Dry such vegetables as corn, string beans, navy beans, mature lima beans, okra, etc.

You can brag about your garden all winter if you have your canned evidence on the dinner table.

Concentrate products, especially soup mixtures, so that each container will hold as much canned food and as little water as possible.

Really there is nothing to canning fruit and vegetables except care, cleanliness, fresh products, jars and heat.

Sugar Supplies for Home Canners.

The submarine has forced fighting Europe to a very strict sugar ration and compelled America to look the situation squarely in the face. There is only so much sugar, there are certain definite needs, and the problem before us is finding a practical plan of distribution. The Food Administration has adopted a certificate system to meet the household needs during the coming fruit season, and to guard against temporary shortages that may occur if more vessels are

diverted from the Cuban trade. The consumer is asked to estimate his needs and fill out a certificate which will be furnished him by his grocer. The dealer is required to forward this certificate to the Federal Food Administrator within one week after it is turned in to him. This plan puts the question up to the individual, and the Food Administration asks the assistance of every householder in bringing about a practical distribution. The success of the plan depends on the good sense and good will of the American citizen. Cooperation, prompt action and a democratic sense of fair play will prevent a sugar shortage in America during the fruit season.

New Flours in Old Recipes.

Many housekeepers have experimented with the substitute cereals and know just how to use them in muffins and other breads. Weight for weight, these flours and brans absorb the same amount of moisture and require the same measure of baking powder to raise them as wheat flour. You can use the new flours in old recipes if you substitute equal weights for the wheat flour called for. A cup of wheat flour sifted and measured lightly weighs 4 ounces. The equivalent of 4 ounces of substitutes expressed in cups is as follows: One cup (4 ounces) wheat flour equals 1½ cups barley flour, 1 cup corn flour, 1 cup fine corn meal, ½ cup coarse corn meal, ½ cup buckwheat, ½ cup rice flour, ½ cup hominy grits, ¾ cup rolled oats (ground). The above equivalents represent an average on these flours, but different mills turn out different grades of flour and weight is the safest guide. If you have no scales, sift flour and measure lightly in a measuring cup.

"Make your acres tote double," says the Progressive Farmer.

J. E. Larson, well known in every county of Oregon as a seed and crop expert, has been engaged by the Portland Seed Company to give practical help to farmers and gardeners in seed selection and in solving problems of planting, cultivation and harvesting. Larson resigned as county agriculturist of Polk County to enter the broader field. For four years he was in charge of the crop extension work of Oregon Agricultural College. Before coming to Oregon he was seed expert for Oklahoma and South Dakota Agricultural Colleges, and was field editor for one of the Orange Judd farm papers in the Dakotas. Mr. Larson was born and raised on an Iowa farm, and knows the practical as well as the scientific side of the farmer's problems. His engagement by the big seed company should prove of inestimable service to Pacific Northwest farmers. Besides visiting the rural districts he will reply to inquiries by mail.—Adv.

War Savings Certificates, modeled on the English plan, were introduced in India in the summer of 1917. The price of issue was 7 rupees 12 annas (7¼ rupees) for a certificate worth 10 rupees at the end of five years. On December 31, 1917, this issue has brought nearly \$100,000,000, and in the central provinces, where the number of subscribers to previous Indian Government loans had never exceeded 100 people, more than 600,000 people have bought War Savings Certificates.

Good business as well as patriotism urges support of the Government in its financial needs. There is no class of Americans more than the farmers of the nation whose own welfare is so indissolubly bound up with that of the United States Government. Buy Thrift Stamps.

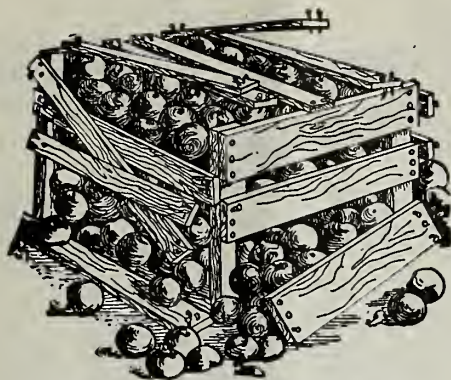
"The one sure way to supply the supreme need for food," reads a proclamation by Governor Bickett of North Carolina, "is to man the bread line with the woman power, the boy power and the girl power of the state."

"Farmers are sometimes the last to heat up; but they stay hot; and in a long fight they are always found sturdily carrying the battle across No-Man's Land to the foe, in the last grim struggle."—Herbert Quick.

For two years not a single new pleasure motor car has been made in England. Luxury business has ceased. The English are leading strenuous lives, but are prospering.

We'll substitute corn for wheat and victory for defeat.

NOW is the time to send to
Milton Nursery Company
MILTON, OREGON
FOR THEIR 1918 CATALOG.
FULL LINE OF NURSERY STOCK.
"Genuineness and Quality"



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

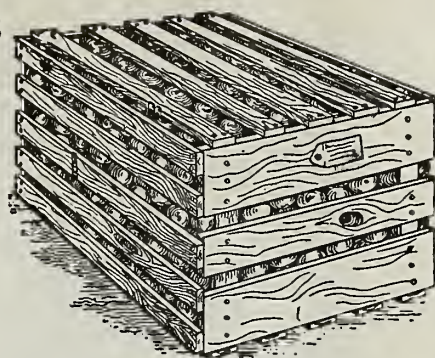
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles

AFTER use of C. F. & I. Co.'s
Cement Coated Nails

Save the Home Garden Surplus

THE crop of vegetables from home gardens promises to be unusually large in practically all sections of the country this year, says the United States Department of Agriculture in a statement just issued. Home gardeners, therefore, it is pointed out, should begin now to plan so that the products raised by them will be used to the best possible advantage, without waste. The statement says:

"There is likely to be an unusually large production of vegetables from small home gardens in most communities this year. Home gardeners, therefore, should lay their plans carefully so that they will be in a position at the appropriate time to make efficient use of their garden produce, both by immediate consumption and by preservation by canning, drying, or in other ways, so that no good food will be wasted. A very material saving can be effected in the food bill in many instances by having the meals consist more largely of the fresh home-grown vegetables and less extensively of the non-perishable foods bought from grocery stores. By following this plan, also, garden owners will relieve somewhat the demand for the non-perishable foods.

"Even with liberal use in the family diet in a fresh state, however, there will be considerable surpluses of vegetables from many home gardens. These should be saved in some way. Canning is the method most usually employed, but it is possible that cans and jars cannot be obtained in sufficient quantities this year to pack the surplus perishables. In such cases many products easily can be preserved by drying. By this method surplus water is driven off by placing sliced products on trays in the sun, over a stove or before an electric fan. The dried foods can be kept perfectly in paper bags or boxes sufficiently tight to exclude insects. Soaking in water will bring the products back practically to their original texture and they may then be cooked like fresh vegetables.

"In putting up vegetables and fruits for future use the home gardener may find the following suggestions useful: If you can obtain cans and jars only in limited numbers, can tomatoes and other vegetables which cannot be dried easily, and such fruits as you prefer

in a juicy form. Wherever possible concentrate succulent foods, such as tomatoes. Preserve or jam the fruits and berries which you prefer in that form, and put them in glasses sealed with paraffin or in wide-necked bottles. Put fruit juices in ordinary bottles. Dry practically any common vegetable except asparagus, egg-plant, radishes, lettuce and the like, and most fruits except strawberries and native grapes. The more important of the vegetables that are usually dried are sweet-corn, snap and string beans, shelled beans, shelled peas, and the root crops. Tomatoes, though consisting in large part of water, are dried successfully by many immigrants from Southern Europe. If a considerable number of cans or jars are at your disposal so that vegetables may be canned be sure to include the more nutritious such as green beans and peas."

"Corn Flour-Plus" Biscuit

You can give up the use of wheat flour and still enjoy hot biscuit for breakfast. Corn flour is the answer. This is a new product to most housekeepers, but it promises to be well known before wheat harvest, as the production of corn flour has increased 500 per cent in the last eighteen months. Corn makes a beautiful white flour, delicate enough for a perfect sponge cake or, what is more to the purpose, a fine biscuit flour that browns like French pastry. Corn flour combines well with any of the substitute cereals in making hot cakes, muffins and biscuit.

Corn Flour and Wheat Biscuit.—2 cups corn flour, $\frac{3}{4}$ cup wheat flour, 6 teaspoons baking powder, 1 teaspoon salt, 3 tablespoons fat, 1 cup milk.

Corn Flour and Buckwheat Biscuit.—1 $\frac{1}{2}$ cups corn flour, 1 $\frac{1}{4}$ cups buckwheat, 6 teaspoons baking powder, 1 teaspoon salt, 3 tablespoons fat, 1 cup milk.

Corn Flour and Rolled Oats Biscuit.—1 $\frac{1}{2}$ cups corn flour, 1 cup ground oats, 6 teaspoons baking powder, 1 teaspoon salt, 3 tablespoons fat, 1 cup milk.

Sift dry materials together. Work in fat well. Combine liquid and dry material, handling lightly. Roll or pat

one-half inch thick and cut as biscuit. Bake in hot oven. The ground oats in the last recipe are prepared by putting rolled oats through the food chopper. All measures are level. In measuring the baking powder, level the spoons with a knife. Drop biscuit require less baking powder than rolled biscuit.

Wheatless Loaf Bread

Counties, towns, hotels and schools have gone wheatless until next harvest. Households are giving up wheatless days for wheatless weeks and months, while kitchens have been turned into experiment stations to see just what can be done with other cereals. Muffins you know and cakes you know, but have you made any wheatless loaf



Fifty-nine Years

of continuous service to the Northwest is the record of this pioneer bank.

Today, as always, it bears the reputation of being at once conservative and progressive—a wise combination.

We solicit accounts, either personal or business.

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TAKE OFF YOUR HAT TO THE MYERS PUMPS

HAY UNLOADING TOOLS DOOR HANGERS

FOR EVERY PURPOSE

Pump the water for your home and farm with a **MYERS PUMP**

Unload your hay and grain quickly and easily with **MYERS HAY UNLOADING TOOLS**

Equip your buildings with **MYERS "Easy to Push and Pull" Sliding Doorways**, and you will save time, labor and money. They cost no more than others and are guaranteed to give the very best of service. Buy them from your Dealer or ask us. Write today for interesting booklets—FREE NO. 120 ORANGE ST. **F.E. MYERS & BRO. ASHLAND, OHIO.** ASHLAND PUMP AND HAY TOOL WORKS.

Fine Oregon Orchard for Sale

Trees 9 Years Old

13 acres, tile drained and irrigated, water costs \$2.50 per acre, of which about 3 acres are in pears, one acre peach fillers, balance some Newtowns and Jonathans, but mostly Spitzenbergs. Trees in fine condition, showing an abundance of fruit spurs. A few loganberries, blackberries and raspberries.

4-room house with porch; fine barn and sheds; 4 chicken houses, about 20 booder houses; good well; electric lights and telephone system; on paved street about one mile from station.

The tract is sprayed, pruned and plowed. Title clear.

Price \$500 per acre on easy terms. No trades. Can give immediate possession.

The city has good schools, a fruit drying plant for culls, also a Fruit Growers' Association, with large warehouse and a Spray Manufacturing plant.

MARK N. TISDALE, Sutherlin, Oregon

bread—bread you can slice and make into toast and sandwiches, provided you can lock it away from the family until it gets cold? Here are a group of successful wheatless breads made with baking powder. If you wish to experiment, try these combinations in yeast breads. Ground oats combine successfully with any of the substitute cereals in making hot cakes, muffins or bread. To prepare ground oats, run rolled oats through the food chopper:

Corn Flour and Oat Bread.— $\frac{3}{4}$ cup liquid, 4 tablespoons fat, 4 tablespoons syrup, 2 eggs, 6 teaspoons baking powder, 1 teaspoon salt, $1\frac{1}{2}$ cups corn flour, 1 cup ground rolled oats.

Rice and Barley Bread.—1 cup liquid, 4 tablespoons fat, 4 tablespoons syrup, 2 eggs, 6 teaspoons baking powder, 1

teaspoon salt, 1 cup rice flour, 2 cups barley flour.

Corn Flour and Buckwheat Bread.—1 cup liquid, 4 tablespoons fat, 4 tablespoons syrup, 2 eggs, 6 teaspoons baking powder, 1 teaspoon salt, $1\frac{1}{2}$ cups corn flour, 1 cup buckwheat.

Barley and Oat Bread.—1 cup liquid, 4 tablespoons fat, 4 tablespoons syrup, 2 eggs, 6 teaspoons baking powder, 1 teaspoon salt, 2 cups barley flour, 1 cup ground rolled oats.

Mix the melted fat, liquid, syrup and eggs. Combine the liquid and well mixed dry ingredients. Bake as a loaf in a moderately hot oven for one hour or until thoroughly baked. Nuts, raisins or dates may be added if desired.

Legume Culture Found Helpful

Many Oregon farmers let the little legume bacteria help them speed up their war production program. These cultures have been used with great success in this state for several years. About 70 per cent of the farmers using the soil inoculation cultures report profit from their use. These cultures are used on leguminous plants—peas, beans, alfalfa, vetch, red clover and alsike. They are not needed if the same crop well inoculated has been grown on the land within two or three years. If the soil is very acid or very dry, the effectiveness of the cultures is greatly decreased. It has generally been found worth while to try them on such ground.

Supplies of the cultures are sent out from the O. A. C. Bacteriology Department this year as in former years. Sufficient material for two acres or less costs 40 cents. Enough for fifteen acres costs 60 cents. Special cultures are required for each kind of crop. Cultures are sent on receipt of payment, or by C. O. D., parcels post. On C. O. D. orders an additional ten cents should be remitted. The demand for cultures being far in advance of the ability to fill orders, the department requests from seven to ten days' advance notice. Soil inoculation cultures to "ginger up" the growth of legumes can be obtained at Oregon Agricultural College. A supply for two acres or less costs 40 cents, for fifteen acres or less 60 cents. State kind of crop and enclose payment for order.

Uncle Sam's Official Newspaper

Owing to the enormous increase of government war work, the governmental departments at Washington are being flooded with letters of inquiry on every conceivable subject concerning the war, and it has been found a physical impossibility for the clerks, though they number an army in themselves now, to give many of these letters proper attention and reply. There is published at Washington daily, under authority of and by direction of the President, a government newspaper, "The Official U. S. Bulletin." This newspaper prints every day all of the more important rulings, decisions, regulations, proclamations, orders, etc., as they are promulgated by the several departments and the many special com-

KEEP BEES!

HONEY IS THE BEST SUBSTITUTE FOR SUGAR and is more Wholesome and Delicious

If you own an orchard or keep bees, you should have a copy of our Catalog. It lists everything for the successful handling of bees and the production of honey. We are pioneers in the bee supply business in the Northwest, are thoroughly familiar with local requirements and carry a large and complete stock. Ask for Catalog No. 204. You can keep bees any place where they can forage within a mile.

PORTLAND SEED CO. PORTLAND, OREGON

mittees and agencies now in operation at the National Capital. This official journal is posted daily in every post-office in the United States, more than 56,000 in number, and may also be found on file at all libraries, boards of trade, and chambers of commerce, the offices of mayors, governors, and other federal officials. By consulting these files most questions will be found readily answered; there will be little necessity for letter writing; the unnecessary congestion of the mails will be appreciably relieved; the railroads will be called upon to move fewer correspondence sacks, and the mass of business that is piling up in the government departments will be eased considerably. Hundreds of clerks, now answering correspondence, will be enabled to give their time to essentially important rulings, decisions and war work, and a fundamentally patriotic service will have been performed by the public.

Drying and Evaporating Fruits

In this issue appears a very valuable article by Professor C. C. Vincent, "By-Product Investigations." Last year many fruit growers found it very profitable to raise vegetables between the apple trees, which enabled them not only to sell fresh vegetables but to evaporate and can for winter use and also for sale. Evaporating and canning vegetables is more important now than ever before and this year it is to be hoped this industry will be carried on much more extensively. Europe will be drawing more heavily on America for all foodstuffs, and every housewife should store enough to supply the wants of her household, and more if possible, thus enabling the factories to sell their entire output for the consumption of our soldiers and our allies.

By-Products Investigations, Etc.

Continued from page 6.

The U. S. Cook Stove Evaporator was used in making the tests at the University of Idaho. It can be used on any kind of a cook stove. The dimensions are: Base 22x16 inches, height 26 inches. The base is made of galvanized sheet iron and the framework of wood. It has eight galvanized wire trays 12x17½ inches and contains twelve square feet of drying surface.

The trays are placed in the framework one above the other, thus forming a compartment through which the heat rises. When drying fruits or vegetables in this evaporator the trays should all be spread with a single layer, and as the drying progresses the upper trays should be moved to the lower part of the drier in order to insure uniform drying. The fresh products should never be piled up on the trays too thick, as this obstructs the free circulation of air through the evaporator and prolongs the time of drying. To secure a good finished product the temperature should never be allowed to go above 150° F. The results secured are shown in the following table:

Products	Weight Fresh Material	Weight when Dry	Time to Dry, Hours	Temperature, Deg. F.
Beans	100	11	10-15	130-140
Turnips	100	8	10	130-140
Carrots	100	13	10	130-140
Corn	100	33	9	130-140
Beets	100	18	6	130-140
Salsify	100	33	2	130-140
Potatoes	100	35	6	130-140
Pumpkins	100	6	4	130-140
Sweet cherries..	100	24	22	130-150
Pie cherries....	100	19	22	130-150
Apricots	100	20	27	130-150
Peaches	100	17	25-30	130-150
Plums	100	22	50-55	130-150
Prunes	100	33	60-70	130-150
Apples	100	20	6	130-150
Pears	100	25	8	130-150

Hot Air Evaporator.

There has also been an increasing demand for information on evaporators somewhat larger than the cook-stove evaporator; those that have been designed for family use, but have a capacity sufficient to dry for market. To supply this information the Zimmerman type of evaporator was selected for experimentation. This portable furnace or hot air evaporator is 24 inches deep, 26 inches wide and 5½ feet high.

This machine has fourteen galvanized wire trays 20x20 inches, making thirty-eight square feet of drying surface. The evaporator is made substantially of gal-

FISH!! FISH!!

100 lbs. salmon in brine, shipping weight	
165 lbs	\$11.00
Smoked salmon, 20 lbs. net	3 25
Dried True codfish, 10 lbs.	1 50

Ask for our fresh and cured fish price list.

T. A. BEARD, 4322 Winslow Place, Seattle, Wash.

Nice Bright Western Pine
FRUIT BOXES
AND CRATES

Good standard grades. Well made. Quick shipments.
Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH

Are there CURLED LEAVES on Your Apple Trees

Then get busy. That means Aphis—
a real danger to your apple profits. Aphids
cause dwarfed and deformed fruit; also spread
fire-blight. Spray at once with

Black Leaf 40

40% Nicotine

**Kills
Aphis**

Recommended by Agricultural Colleges and Experiment
Stations. Don't make the mistake of thinking that
Lime-Sulphur, Arsenate of Lead and Bordeaux kill
Aphis. These sprays don't, but if you are using
them at this time, as you probably are, simply add "Black
Leaf 40" to the mixture, per directions. You will then not
only get the full benefit of these sprays, but also kill Aphis
and without the labor-expense of a separate spraying.

Aphis also attacks Plum, Cherry and other fruits, as well as
truck crops, vegetables, plants and flowers. "Black Leaf 40"
kills all varieties of Aphis, also Pear Psylla, Red Bug, Leaf
Hopper, Thrips and other soft-bodied, sucking insects.

Free Spray Chart

Write today for Free Spray Chart, showing when
and how to spray, and booklets on insect pests
controlled by "Black Leaf 40."

The Kentucky Tobacco Product Co.
Incorporated LOUISVILLE, KY.

Pacific Coast Agents
**United States Steel
Products Co.**

San Francisco
Los Angeles
Portland
Seattle



J. C. Pearson Co., Inc.
Sole Manufacturers

Old South Bldg.
Boston, Mass.

PEARSON

ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the good is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.

ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

NAILS

Make more Money Pull big stumps by hand



Showing
easy lever
operation

Clear your stump land cheaply—no digging, no expense for teams and powder. One man with a K can rip out any stump that can be pulled with the best inch steel cable.

Works by leverage—same principle as a jack. 100 pound pull on the lever gives a 48-ton pull on the stump. Made of the finest steel—guaranteed against breakage. Endorsed by U. S. Government experts.

K

Stump Puller

Write today for special offer and free booklet on Land Clearing.

Walter J. Fitzpatrick
Box 598
182 Fifth Street
San Francisco
California

Yakima County Horticultural Union

FRED EBERLE, General Manager

Growers' Agents Yakima Valley Fruit

General Offices, Yakima

WAREHOUSES:

Yakima, Naches, Selah, Wapato,
Exchange and Tieton

COLD STORAGE IN CONNECTION

Genuine comfort if
you ask for and get—

Mayer

Martha Washington Comfort Shoes

Beware of Imitations—
name and trade-mark
stamped on the sole.

F. Mayer
Boot & Shoe
Company
Milwaukee,
Wis.



HONOR BILT



37
DIFFERENT
STYLES

vanized iron. The furnace front and back is made of heavy cast iron and the body of the furnace of heavy sheet iron. The evaporator is so constructed that the currents of heated air which arise from the furnace pass through and around the fresh products, not only from the bottom, but from the sides also.

To secure a well finished product it is necessary to have a good distribution of air throughout the evaporator. This evaporator is so constructed that there is an even distribution of hot air over each tray of fruit, which insures uniform drying of the products. The fruits and vegetables evaporated in this hot air evaporator were exceptionally fine in every respect. The results secured are shown in the table following:

Products	Weight Fresh Material	Weight when Dry	Time to Dry, Hours	Temper- ature, Deg. F.
Beans	100	13	6-12	130-140
Turnips	100	9	6	130-140
Carrots	100	13	8	130-140
Corn	100	33	20	130-140
Beets	100	18	7	130-140
Salsify	100	33	2	130-140
Potatoes	100	29	5	130-140
Pumpkins	100	6	4	130-140
Pie cherries....	100	25	8-13	130-150
Apricots	100	20	13	130-150
Peaches	100	17	30-35	130-150
Plums	100	23	56	130-150
Prunes	100	35	47	130-150
Apples	100	17	7	130-150
Pears	100	23	13	130-150

Steam Evaporator.

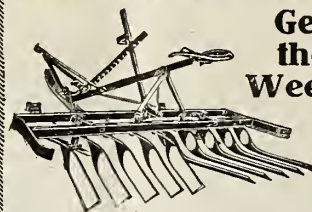
In communities where there are not sufficient products grown to justify the construction of a large commercial evaporator, the small steam cabinet evaporator could be used to advantage. This is particularly true in a locality where there is already a small cannery in operation, for the boiler could be used for both purposes. These steam cabinet evaporators are very popular at the present time in parts of New York and Canada. When properly constructed they give entire satisfaction.

The following table shows the different products evaporated, the weight after evaporation, the length of time to evaporate and the temperature maintained:

Products	Weight Fresh Material	Weight when Dry	Time to Dry, Hours	Temper- ature, Deg. F.
Peas	100	23	7	130-160
Beets	100	16	5	130-160
Beans	100	14	5-10	130-160
Turnips	100	9	6	130-160
Carrots	100	12	6	130-160
Corn	100	29	13	130-160
Salsify	100	31	2	130-160
Cauliflower ..	100	14	8	130-160
Potatoes	100	33	5	130-160
Pumpkins	100	6	4	130-160
Currants	100	27	7	130-160
Raspberries ..	100	13	10	130-160
Pie cherries....	100	20	6-10	130-160
Sweet cherries..	100	21	12	130-160
Apricots	100	15	15	130-160
Peaches	100	17	21	130-160
Plums	100	22	27	130-160
Prunes	100	30	38	130-160
Loganberries ..	100	15	13	130-160
Dewberries ..	100	20	14	130-160
Apples	100	16	6	130-160
Pears	100	23	13	130-160

The type installed at Moscow was secured from the Henninger & Ayes Company, Portland, Oregon. This cabinet is 84 inches long, 36 inches wide and 72 inches high. It has twenty-four galvanized wire trays 22x36 inches, with 132 square feet of drying surface. There are fourteen pipes under each two trays running across the evapora-

Get the Weeds



Weeds and profits cannot grow in the same orchard. Weeds sap moisture and steal plant food. Destroy them with the fast-working, light-running

"Acme" Foot-Lift Weeder

The sharp-ground knife edges cut all weeds—till deep or shallow as desired. Foot lift lever clears trash and makes transportation easy. Guards at end protect trees. Sizes, 1 horse to 3-horse.

Write today for our free book
"The Acme Way to Crops That Pay."

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Street

Portland
Oregon

True-to-Name Nursery

ESTABLISHED 1902

Offers a general line of nursery stock, with a special offering of Anjou, Bosc and Bartlett Pears. These trees are grown with buds personally selected from bearing trees and are guaranteed "true-to-name."

Address all communications to

TRUE-TO-NAME NURSERY

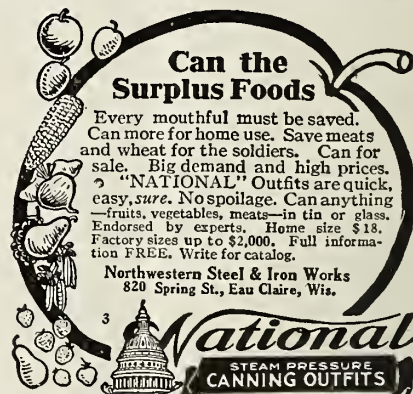
H. S. Galligan, Prop.

Hood River, Oregon

Can the Surplus Foods

Every mouthful must be saved. Can more for home use. Save meats and wheat for the soldiers. Can for sale. Big demand and high prices. "NATIONAL" Outfits are quick, easy, sure. No spoilage. Can anything—fruits, vegetables, meats—in tin or glass. Endorsed by experts. Home size \$18. Factory sizes up to \$2,000. Full information FREE. Write for catalog.

Northwestern Steel & Iron Works
820 Spring St., Eau Claire, Wis.



National
STEAM PRESSURE
CANNING OUTFITS

700 ACRES

of the highest quality Willamette Valley soil, all in one chunk, is probably worth no more than passing notice. But if you knew that 200 acres was in bearing fruit, 200 more in grain, balance pasture, you might give it a second thought. And if I told you it was not in Southern Oregon, and that there was not an apple tree in the bunch, you might write for further information. This property can be bought and bought right. Ample buildings, equipment and shipping facilities. No curiosity seekers need answer. If you have \$100,000 or more we might get together. Your reply will reach the owner and be treated in confidence.

Address X Y Z, care Better Fruit

tor. The steam enters the cabinet through the top row of pipes and circulates back and forth through the evaporator, finally returning to the boiler through a return pipe at the bottom of the cabinet. A five-horsepower boiler furnishes ample steam for an evaporator of this type.

Capacity of Evaporators.

In the following table is shown the capacity of these different types of evaporators at one charge:

Products	Steam Lbs.	Hot Air Lbs.	Cook Stove Lbs.
Beans	200	50	20
Turnips	100	30	10
Carrots	96	30	8
Corn	200	56	24
Cauliflower	144	42	14
Beets	144	45	10
Salsify	80	25	8
Pumpkins	110	28	10
Potatoes	100	30	14
Pie cherries	300	80	25
Apricots	264	80	25
Peaches	450	124	36
Plums and prunes	600	150	60
Sweet cherries	350	98	40
Loganberries	240	70	25
Dewberries	220	60	22
Raspberries	250	75	24
Apples	288	84	24
Pears	288	84	24

By any one of the methods described above practically all fruits and vegetables, in excess of those needed in the homes and in the local market, can be conserved. It is only by resorting to such methods of conservation that we can help win the final victory in this great war. When discouraged, remember the words of the writer who said.

Somebody said it couldn't be done,
But he with a chuckle replied
That, may be it couldn't, but he would be one
Who wouldn't say so until he tried.
He started to sing as he tackled the thing
That couldn't be done and he did it.
There are thousands to tell you it cannot be
done,
There are thousands of prophesy failure,
But just start in to sing as you tackle the thing
That "cannot be done," and you'll do it.

Crops and Advertising

THERE are statistically two crops of apples in the United States. One is called the "agricultural crop," and the other is called the "commercial crop." The former represents all the apples on the trees, the latter the apples for transportation and market. The commercial crop, of course, is a fraction only of the agricultural crop, and varies widely. For instance, the latter may be two hundred million barrels, while the commercial crop, according to conditions, may be forty, sixty or eighty million barrels. But whichever crop we think of, it is a tremendous business. The agricultural crop mentioned would make a river flowing solid with apples sixty miles long, a hundred yards wide and ten feet deep. It would make ten piles as big as the Great Pyramid of Ghizeh. It would wrap a band around the earth at the equator a foot thick and seven feet wide. It staggers the imagination.

In making the above statement there is a definite object. Facts like these awaken the mind to a vivid sense of "size," and stir it to think in terms of "importance." When, then, national magazines tell in descriptive editorials what America's millions may and should do with apples, the editor of such a

Getting ready with the punch gives a fellow a fine appetite for mess call and a chew of Gravely.



It only Takes a Minute to send him a pouch of Real GRAVELY Chewing Plug

Just drop into any wide awake dealer around here, give him 10 cents for the pouch of Real Gravely, complete in the special envelope ready for mailing.

Address it according to the official directions he will give you. Put on a 3 cent stamp—and Uncle Sam's Mails will see that he gets it.

Real Gravely is the tobacco to send. Not ordinary plug loaded up with sweetening, but condensed quality. It's worth sending a long way, and when he receives it he's got something.

Give any man a chew of Real Gravely Plug, and he will tell you that's the kind to send. Send the best!

Ordinary plug is false economy. It costs less per week to chew Real Gravely, because a small chew of it lasts a long while.

SEND YOUR FRIEND IN THE U. S. SERVICE A POUCH OF GRAVELY

Even "over there" a 3c. stamp will put it into his hands.

P. B. GRAVELY TOBACCO COMPANY, Danville, Va.

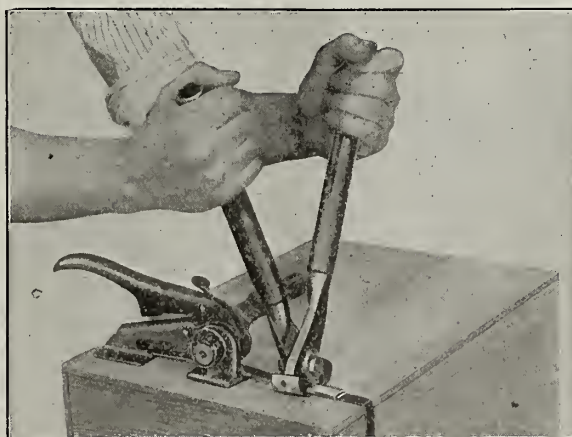
The Patent Pouch keeps it Fresh and Clean and Good

—It is not Real Gravely without this Protection Seal

Established 1831



Steel Box Strapping



Used in connection with metal seals consists of encircling a package with a metal strap, drawing the strap very tight and interlocking the overlapping strap-ends within a metal sleeve (SIGNODE) in such a manner that the joint has a greater tensile strength than the strap itself. Nails, rivets and buckles, with their attendant objections, are entirely eliminated.

Write for Catalog

Acme Strapping packed in bbls. of about 500 lbs. or larger pkgs.
Metal Seals packed in cartons containing 2,000-2,500 seals.

ACME STEEL GOODS CO. MFRS.

Factory: 2840 Archer Ave., Chicago

311 California St., San Francisco

Stock carried in Seattle and San Francisco



IMPROVE = PROTECT
YOUR FRUIT CROP

Arsenate of Lead

For twelve years the GRASSELLI BRAND has been used throughout the fruit growing sections of the Northwest where it has given unvarying satisfaction to the user because of its all-round good qualities:

IT kills the worms.

IT sticks well to the foliage.

IT is high in suspension qualities and will always be found dependable and uniform.

THE FRUIT GROWERS' STANDARD

Grasselli Arsenate of Lead Paste
Grasselli Arsenate of Lead Powder

The Grasselli Chemical Co.

Established 1839

CLEVELAND, OHIO

BRANCHES:

NEW YORK
PHILADELPHIA
BOSTON

ST. PAUL
CHICAGO
CINCINNATI

DETROIT
MILWAUKEE
ST. LOUIS

PITTSBURGH
NEW ORLEANS
BIRMINGHAM

magazine realizes that it is worth while, that apples are apples, by token of a huge industry; he sees the tremendous pyramid that America's apple crop would make, and he says to himself: "I will say a thing or two about the use of these apples. It will be worth while." On the one side he sees the vast store of fruit, and the workers growing them, and on the other side there is the throng of consumers.

"Perhaps never before in their history have the national magazines taken such interest in the apple," the publicity manager of the Northwestern Fruit Exchange is quoted as stating. "We find the women's journals, with their special pages devoted to culinary subjects, have taken hold in splendid style and have veritably made the apple 'king'.

Housewives have been impressed with the nutritive qualities and the wholesomeness of apples, and they have been presented with all kinds of ingenious recipes. Piping hot pancakes with apple jelly, gingerbread gems with apples, war muffins with apple sauce, sweet potato and apple baked together—all these suggestions and hundreds of others have encouraged the use of apples. It will certainly be a great satisfaction to the apple grower to know that 'somebody is doing something' for him. While he is tilling the soil of his field, as it were, it is a satisfaction to know that the field of printers' ink is being well tilled, too."

The well-known magazine "Every-woman's World" in a recent issue published almost entire the Fruit Growers'

Agency's press article, "Eat an Apple, Send a Biscuit," which contained valuable information on apple nutrition, and which was sent out with a special letter to every editor of a woman's magazine on the continent.

This article seems to have occasioned an amount of interest, as is noted, for instance, in the pages of "Good House-keeping," which quoted several of the phrases used therein and also devoted quite a space to nutrition of apples.

Bee Keepers Can Get Sugar for Their Bees

Oregon bee keepers will be able to get sugar to feed their bees where the supply of honey has run low. The value of honey as a factor in the increased food supply campaign has been recognized by the Federal Food Administrator for Oregon, and W. K. Newell, assistant, writes Prof. A. L. Lovett, entomologist at Oregon Agricultural College, as follows: "I think you may safely promise all who have applied to you that permission will be given them to purchase the sugar on application either to this office direct or to their county chairman. We appreciate fully the value of the honey crop and the necessity for feeding of the bees for a short time in the spring."

General Apathy and Private Interest are two enemies of our national welfare. Each is as dangerous as a Kaiser's agent and should be excluded from every American home and industry.

GROWERS!

"Use Your Brains to
Wrap Your Fruit"

STOP! THINK!

"CARO FIBRE"

Fruit Wrappers

LOOKS BEST

PACKS BEST

PICKS UP BEST

"CARO" DON'T TEAR

STRONG DRY

STRONG WET

THE BUYER
KNOWS "Caro" Prolongs
the Life of Fruit

Don't Be Fooled by PRICE. Don't Be Penny Wise

Give Your Fruit a Chance
INSIST on Getting "Caro Fibre"

Your Shipper Can Supply You,
or Write to

Union Waxed & Parchment Paper Co.

F. B. DALLAM, Agent
Santa Maria Building, 112 Market Street
San Francisco, Cal.

Essentials of Air-Cooled, Etc.

Continued from page 5.

but not practicable ventilating system would provide for the removal of the storage house walls every night. In our practical storage house we are limited by the requirements of reasonable expense and the necessity for supplying walls of considerable strength. How can we approach the ideal system and yet meet practical requirements? The windows for the intake of cold air may profitably be made 24x36 inches, and one such opening should be provided for every ten feet in length as well as width on each side and end of the house. The intakes should open beneath the false floor. In an above-ground storage house this makes it necessary for the false floor to be constructed above the level of the windows. In basement storages the same result can be attained by encasing the windows with air ducts leading from the top of the windows to the level of the false floor. Insulated shutters hinged at the top should be supplied for all windows. The false floor should be at least eighteen inches above the earth or concrete floor, and a greater height is desirable. A very satisfactory decking is made of 2x4's laid flat and spaced one inch apart. A warning in regard to the strength of the floor supports is necessary. In one of the houses built in the summer of 1917 the architect was instructed to figure a floor construction capable of supporting a load of fruit stacked twelve boxes high, the weight per box being estimated at forty pounds. The instructions were not correct, because the weight of a box of packed apples is more than forty pounds. The architect recommended 2x12-inch fir joists laid sixteen inches apart over a span of twelve feet. This construction probably was as light as he dared make it. Fir joists could not be secured at the time and in order to complete the house before apple harvest pine joists were substituted. When harvest did arrive the apple crop was found to be unexpectedly large and a car shortage set in, which made it necessary to stack the apple boxes more than twelve high, and a part of the floor collapsed. This is only one example of the bad results which come from weak construction. The next important consideration is the outlet flues. They should be constructed along the central line of the building, in order that the greatest possible height may be reached before passing through the roof. To obtain free, abundant circulation the openings must be of liberal size, and the air shaft must be straight and direct. We are recommending shafts three feet square for every thirty feet in length as well as breadth. For larger buildings larger flues are necessary, and if the length exceeds forty feet two flues should be supplied. Trap doors should be placed in the inlet opening at the bottom of the flue and in the outlet opening at the top.

As I have pointed out before, the cold air outside the storage house is only slightly heavier than the air inside and at best the flow of the air through the

First Aide to Hostesses Who Know

PERHAPS it's only a couple of friends who drop in for a little chat. Or—it may be a knitting party, an Aid Society meeting or what not. Or—who knows?—perhaps it's a big "party"—music and dancing and Japanese lanterns and all that.

In any event, don't overlook the help Ghirardelli's can give you. Whether it's two cups for yourself—or two gallons for your "big affair"—you can make it just as easily.

Just *one* reason why Ghirardelli's has always been first aide to hostesses who know.

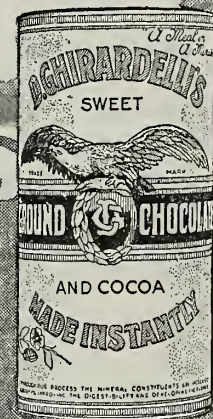
*In ½ lb., 1 lb. and 3 lb. cans; a
tablespoonful—one cent's worth—
makes a cup.*

D. GHIRARDELLI CO.

Since 1852

San Francisco

Ghirardelli's Ground Chocolate



Get 'em Quick!

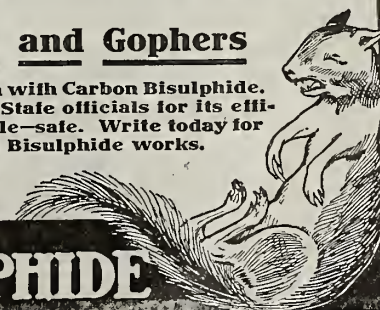
Rid your place of squirrels, gophers, prairie dogs, etc. Do it now when the young of these crop-destroying pests are being born. It's easy and cheap—when the ground is full of moisture to

Exterminate Squirrels and Gophers

and other rodent pests. Just gas them with Carbon Bisulphide. Used and recommended by U. S. and State officials for its efficiency and economy. Simple to handle—safe. Write today for prices and folder telling how Carbon Bisulphide works.

WHEELER, REYNOLDS & STAUFFER
627 California St., San Francisco, Cal.

with
CARBON BISULPHIDE





**PERFECTION IN
FRUIT LABELS**

THE SIMPSON & DOELLER CO.
1423-24
NORTHWESTERN BANK BLDG.
PORTLAND, OREGON.
E. SHELLEY MORGAN
NORTHWESTERN
MANAGER

WE CARRY IN PORTLAND,
STOCK LABELS FOR
APPLES, PEARS,
STRAWBERRIES
& CHERRIES

SEND FOR SAMPLES AND PRICES

A Message for Fruit and Vegetable Growers

We desire to get in touch with Fruit and Vegetable Growers in all parts of the country in order to establish Fruit and Vegetable Drying Plants for single firms that want to build new and up-to-date drying plants for themselves and with two or more Growers that would favor the construction of a drying plant on a co-operative basis.

There are many millions of dollars worth of Fruit and Vegetables left to rotten on the ground and many more millions of dollars are paid in freight rates, tin cans and boxes that can and must be saved. We will invest some of our own capital, if you wish, as we are sure that it is to our mutual benefit, if you write us today for particulars. All information on this subject will be given cheerfully and free of charge. If you are in business for making the best profits write now.

The A. A. A. Evaporator Manufacturing Co., Inc.
2371-73 Market Street, San Francisco, California

F. W. BALTES AND COMPANY *Printers · Binders*



Unexcelled facilities for the production of Catalogues, Booklets, Stationery, Posters and Advertising Matter. Write us for prices and specifications. Out-of-town orders executed promptly and accurately. We print **BETTER FRUIT**.

**CORNER FIRST AND OAK STREETS
PORTLAND, OREGON**

house is sluggish. The velocity can be increased by the use of fans and the house can be made more efficient, provided the right kind of fan is used and provided it is properly placed. To date I know of no air-cooled storage where a fan is giving satisfactory results. In most cases where they have been tried they have been discarded. The reason is very evident: the fan either did not throw enough air, because it was too small, or it was placed in such a position that it did not supply air uniformly to all parts of the room. Disc fans are of very little value, because their volume is small and because they tend to churn rather than deliver air when working against pressure. Where blowers have been tried they have not proved satisfactory because they were too small or because they were improperly located. The circulation which they created was not uniform or general. Another charge that was made against them was that they delivered a small stream of air at high velocity rather than a large stream at low velocity, resulting in the generation of heat by friction. Air moving at extremely high velocity is undesirable, too, because it carries too much dust into the storage room. Dust is very objectionable where fruit is stored without wrappers, because it sticks to the oily apples and makes them very unattractive. The best type of fan is the sirocco or multiple vein fan, a type in which the blades are parallel with the axis. For a room thirty or forty feet wide and forty or fifty feet long a three-foot fan placed at the mouth of an outlet flue probably will prove satisfactory. The opening into the outlet flue should be in the ceiling near the center of the room. In rooms more than fifty feet long, the air should be taken from the storage room to the fan through a duct swung along the ceiling equally distant from the side walls. Intake openings will occur at intervals along this duct to take the place of the one large opening at the center of the room in smaller houses. The capacity of the fan necessarily must be increased with the size of the house. The openings for the taking of cold air into a storage house equipped with a fan should be similar to those which I have described for a house with gravity circulation. A false floor is absolutely necessary, for unless the incoming air enters beneath the false floor it will not come in contact with all the fruit. Where the windows for the intake of cold air open above the fruit the air will tend to take the shortest route across the top boxes to the vacuum created by the fan in the center of the room.

To recapitulate, a large multiple vein fan draws air from all sides of the room toward a central air duct. The velocity of the air passing through the room is not objectionably rapid because it does not pass through the fan until after it has done its work in the storage house. As a result there is no loss of refrigeration due to frictional generation of heat, and the amount of dust carried into the storage room is reduced to a minimum. After the apples are once cooled in the fall of the year, the matter of keeping them cool would not be difficult pro-

vided there were no prolonged periods of warm weather. But prolonged warm periods do occur and they make the application of some form of insulation necessary.

One of the best insulating materials available is dead air (still air). The only way in which we can maintain a dead air space within a wall is to confine the air within minute areas between bits of other material. Fortunately a cheap and effective material is available, namely, mill shavings. In a paper read before the American Warehousemen's Association a good many years ago George H. Stoddard presented sectional diagrams of walls insulated with shavings, with hairfelt, with granulated cork, and with alternate layers of $\frac{7}{8}$ inch spruce and $\frac{3}{4}$ inch air space. His diagrams were the result of tests which he had made on sections of walls built of the above materials. He concluded that an 8-inch layer of mill shavings is the equivalent of $4\frac{1}{4}$ inches of hair felt, $6\frac{1}{2}$ inches of granulated cork, or five layers of $\frac{7}{8}$ -inch spruce separated by $\frac{3}{4}$ -inch air spaces. In a wall sixty feet long and ten feet high the hair felt costs \$53, the granulated cork costs \$90, and the spruce costs \$95 (Yakima prices), while the shavings cost only \$10 plus the cost of transportation. Insulating material must be dry when applied and it must be kept dry after it is put into a wall, or it will lose its insulating value. Shavings in walls can be kept dry by lining the inside of the retaining wall with odorless waterproof paper. Whenever the workmen tear the paper, they should replace the torn sheet with an unbroken one, or patch the hole so that air cannot enter. The paper should be lapped at all joints so as to thoroughly exclude outside air.

There is some tendency for apples to shrivel in air-cooled storage, the seriousness of the shriveling varying with the variety of apple, the temperature maintained, the operation of the ventilators and the provisions that have been made for humidifying the atmosphere. Shriveled apples are not attractive, their selling value is greatly depreciated, and they are tough and poor of quality. I have often noted that apples in warm storage houses were more shriveled than those in cool storage houses. I think this condition was due chiefly to the fact that the warmer storage houses were those which had been ventilated in the daytime when the humidity of the atmosphere was relatively low. In our inland valleys the atmosphere becomes very dry in the daytime, and it picks up moisture very rapidly from all surfaces with which it comes in contact.

Reliable and accurate data are not available to indicate the exact percentage of humidity desirable. Cold storage houses often have a relative atmospheric humidity of 85% to 90%. Air-cooled storage houses have at least 80%. At present I can recommend no method which will maintain that amount of moisture during the fall of the year. Proper operation of the ventilators, sprinkling, and the use of mechanical humidifiers will help.

The House of Rex

The Institution in Spray Manufacturing

*Founded Upon Quality and
Developed by Experience
The Right Articles
The Right Service
The Right Price*

Write your nearest "REX" Company for prices and service.

Remember, from them you can obtain a

" 'REX' FOR EVERY ILL."

**Yakima Rex Spray Company, Yakima, Wash.
Wenatchee Rex Spray Company, Wenatchee, Wash.
Payette Valley Rex Spray Company, Ltd., Payette, Idaho**



Cook in a cool, comfortable kitchen this summer. An oil cook stove is comparatively inexpensive to buy and it will soon pay for itself in comfort and lower fuel expense. Meals in a jiffy, and a cool kitchen in summer.

Bakes, broils, roasts, toasts. Better cooking because of the steady, evenly-distributed heat. More convenient than a wood or coal stove for all the year 'round cooking, and more economical.

The long blue chimneys prevent all smoke and smell.

In 1, 2, 3 and 4 burner sizes, with or without ovens. Also cabinet models. Ask your dealer today.

NEW PERFECTION OIL COOK-STOVE

STANDARD OIL COMPANY
(California)

A Distinguished Line of Pianos

In "straight" Pianos we carry a very comprehensive line ranging in price from \$285 to \$3000—each "make" has been selected by us as the very best of its grade.

In the neighborhood of \$300 we carry the Aldrich, a good dependable piano at a very moderate price—it will give the purchaser excellent service.

From \$375 to \$450 we offer the Stroud, Kurtzmann, Emerson and Estey Pianos—four very substantial "makes" which are giving a life time service in thousands of homes throughout the United States.

From \$450 to \$600 we have the Krakauer, A.B. Chase and Weber—these instruments are high grade instruments, in fact they are old and famous makes.

Then at \$575 and upward there is the Steinway, the Standard by which all pianos are judged—To have a Steinway is to have the Best.

Bear in mind we will arrange convenient terms of payment on any Piano—even the Steinway.

We invite you to call at any of our stores—or write us asking for illustrated catalogues and prices

*We are dealers in Steinway and other Pianos,
Pianola Pianos, Aeolian Player Pianos, etc.*

Sherman, Clay & Co.

**Kearny and Sutter Streets, San Francisco
Sixth and Morrison Streets, Portland
Third Avenue, at Pine Street, Seattle
928-30 Broadway, Tacoma
808-10 Sprague Avenue, Spokane**

Stores also at Oakland, Sacramento, Stockton, Fresno, San Jose, Santa Rosa, Vallejo

In conclusion, a great number of storage houses are going to be built in the near future. A condition has arisen which demands that some place be provided for the holding of fruit till cars can be supplied for its transportation. Therefore it is not necessary for us to urge the construction of storage houses. But we do believe that we cannot say too much on the subject of proper construction. If the Department of Agriculture can persuade you to provide ample means for ventilation, apply sufficient insulation, and take some precautions for the control of humidity, that part of our task which deals with the construction of air-cooled storage houses will have been largely accomplished.

Attendants Allowed on Green Fruit Cars

The traffic department of the Northwestern Fruit Exchange, J. Curtis Robinson manager, is just in receipt of an important Oregon Short Line tariff supplement which embodies a long-sought improvement in connection with apple shipments, hereafter attendants being permitted to accompany cars in transit for protection of apples against frost. "We were a long time getting this change," states Mr. Robinson, "and it is one that will be welcomed all over the Pacific Northwest among the fruit growers and shippers. The supplement which embodies this ruling is No. 10 to the Oregon Short Line Tariff 2486-G. It contains an item permitting attendants to accompany shipments of apples during the months of October, November, December, January, February, March and April, to look after fires in the cars as a protection from frost. This refers to all green fruits. The attendants are to be furnished with transportation going and returning, that is, from the point of shipment to destination and return. It is provided, however, that the return ticket is dated within thirty days from date of arrival of shipment."

The sugar that goes to waste in the bottom of American tea cups would be a godsend to our Allies in Europe.

Join the Red Cross. They are doing the greatest humane work in Europe that has ever been accomplished.

Remember, three sprays will not always get codling moth. Sometimes it takes four, sometimes five.

STATE OF NEW YORK.

THE ADJUTANT GENERAL'S OFFICE.
ALBANY, March 23, 1918.

GENERAL ORDERS, No. 15.

In order to assist those engaged in agricultural pursuits which are so necessary to the successful prosecution of the war, commanding officers of organizations of the New York Guard are directed to excuse from attendance at drills during the months of April, May, June, July, August and September, upon their own application, those members of their commands not on active duty guarding property who are actually engaged in civil life in farm labor, whenever their attendance at drills would interfere with their agricultural employment.

By command of the Governor:

Official: **CHARLES H. SHERRILL,**
Edward J. Westcott, The Adjutant General.
Major, Assistant to The Adjutant General.

Mr. Fruit Grower:

The 1918 apple crop will, in all probability, be the largest yet recorded. Also, there is certain to be the greatest scarcity of labor yet experienced, especially of experienced packers and sorters.

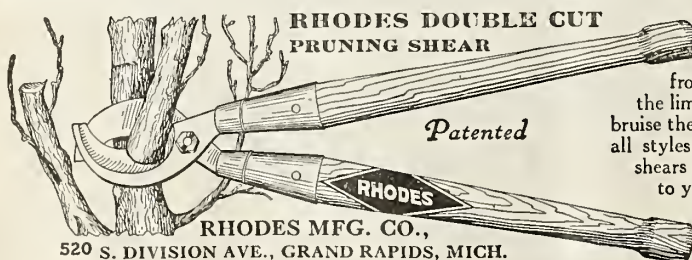
With a **CUTLER FRUIT GRADER** you can teach inexperienced help to pack and sort and handle your crop quickly and at the least cost.

We are giving discounts for early orders and shipments.

WRITE NOW for circular and prices.

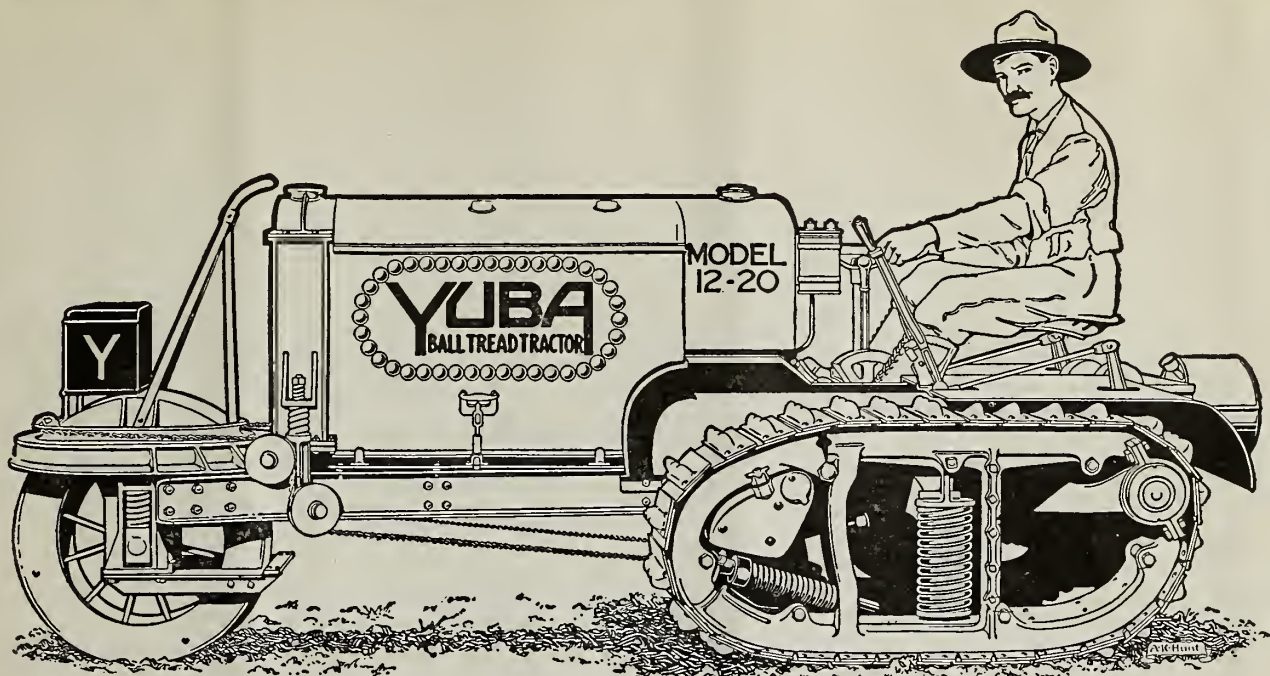
CUTLER MANUFACTURING CO.

New Address: 351 East Tenth Street, Portland, Oregon



THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door.

Write for circular and prices.



IMMEDIATE DELIVERY

YUBA Ball Tread Tractors, Model 12-20, are now being delivered.

To relieve the shortage of labor—to hasten the planting—to insure the work done now, order a Yuba 12-20 for immediate delivery.

The price is \$2750⁰⁰ cash (f. o. b. Benicia, California)—the number ready for shipment is limited—wire your order and put one to work.

PEACE—the only way to get it is to fight for it. We're doing our all—three shifts—every hour of the 24—turning out tractors for you.

Get one, put it to work—it will keep going day and night and rarely need repair.

Quick action in securing one of the Yuba Tractors means sure crops for you—and food for our soldiers.

YUBA MANUFACTURING COMPANY

DEPARTMENT D-1

433 CALIFORNIA STREET
SAN FRANCISCO

The World

Our Orchard

PRIVATE SALE vs. AUCTION

Experience has demonstrated clearly the manifold advantages of sale by private treaty, which method is now acknowledged on all sides to show more satisfactory results than the auction.

Assuming that you are anxious to dispose of your fruit in the best possible manner and to the best possible advantage we, as **PRIVATE SALESMEN**, have no hesitancy in laying our claim before you.

Whether you prefer to sell your fruit on an outright f.o.b. basis or prefer to have it handled for your own account on a consignment basis, both of which methods are entirely agreeable to us, the fact remains that the firm of

Steinhardt & Kelly

101 PARK PLACE

NEW YORK

is in position to give you the best possible service. Our reputation of
“Never Having Turned Down A Car”

although practically 90% of our business is done on an outright purchase basis, is a record of which we feel deservedly proud.

Our Market

The World